**University of Alberta**

# Understanding Excessive Prenatal Weight Gain Among First Nations Women

by

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# DEDICATION

I would like to dedicate this thesis to my parents, William and Christine Black who have been incredible role models and have encouraged and inspired me to pursue my dreams and be the best I can be. You have always believed in me and provided unwavering love, guidance, and support, for which I am truly grateful.

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# CHAPTER 1:

# INTRODUCTION

## Rationale

Excessive weight gain during pregnancy has negative health implications for both mother and infant including pregnancy complications (Johnson, Longmate & Frentzen, 1992; Witter, Caulfield, & Stoltzfus, 1995; Young & Woodmansee, 2002), high birth weight (Bianco et al., 1998; Cogswell, Serdula, Hungerford, & Yip, 1995; Edwards, Hellerstedt, Alton, Story, & Himes 1996), and post-partum weight retention (Keppel & Taffel, 1993; Gunderson & Abrams, 2000; Lederman et al., 1997; Ohlin & Rossner, 1990; Scholl, Hediger, Schall, Ances, & Smith,1995). For Aboriginal populations, the implications of excessive prenatal weight gain are particularly worrisome. The association between excessive weight gain in pregnancy and post-partum weight retention is concerning in view of the already high prevalence of obesity among Aboriginal women (Katzmarzyk & Malina, 1998). Gaining excessive weight in pregnancy may worsen weight status for women who are already overweight or obese and may result in women of normal weight becoming overweight (Scholl et al., 1995). Excessive prenatal weight gain has been proposed as an important contributor to the incidence of obesity (Cogswell, Perry, Schieve, & Dietz, 2001). In turn, obesity is associated with an increased risk of type 2 diabetes (Kumanyika, Jeffery, Morabia, Ritenbaugh & Antipatis, 2002; Mensink, Feskens, Saris, DeBruin, & Blaak, 2003) for which the prevalence is alarmingly high among Aboriginal women (First Nations and Inuit Regional Health Survey National Steering Committee, 1999).

The association between excessive prenatal weight gain and high birth weight is also important for Aboriginal populations considering the higher prevalence of high birth weight among Aboriginal infants compared to Canadian infants in general (Health Canada, 2003a; Rodrigues, Robinson, Kramer & Gray-Donald, 2000). Although the prevalence of excessive prenatal weight gain has not been studied among Aboriginal women, studies of white, black, and Hispanic North American populations indicate that most women do not gain within the recommended ranges (Abrams, Altman, & Pickett, 2000) and many over-gain (Abrams et al.; Caulfield, Witter, & Stoltzfus, 1996; Cogswell, Scanlon, Fein & Schieve, 1999; Lederman et al., 1997; Lederman, Alfasi, & Deckelbaum, 2002).

Limited studies are available on the determinants of excessive prenatal weight gain. Increases in the quantity of food consumed during pregnancy is related to weight gain and the risk of gaining excessive weight (Olson & Strawderman, 2003) and women tend to eat more and have less dietary restraint during pregnancy (Clark & Ogden, 1999; Conway, Reddy, & Davies, 1999; Davies & Wardle, 1994; Fairburn & Welch, 1990). Physical activity in pregnancy is associated with lower weight gain, within the recommended ranges (Clapp & Little, 1995; Olson & Strawderman, 2003). There is also indication that women who receive instruction from their physician to gain within the recommended ranges are more likely to do so (Cogswell et al., 1999; Taffel, Keppel, & Jones, 1993).

Social support is positively associated with health behaviours in pregnancy including nutritional intake and physical activity (Schaffer & Lia-Hoagberg, 1997; Walker, Cooney, & Riggs, 1999). However, there is a paucity of research on the

relationship between social support and excessive prenatal weight gain. One study found a variable influence of social support on weight gain depending on women's prepregnancy body mass index (Olson & Strawderman, 2003). Low family income has also been associated with weight gain and the risk of gaining excessive weight (Olson & Strawderman, 2003).

Given the limited research on excessive prenatal weight gain, the obesity literature may be drawn upon to provide insight into the influences on weight gain. The "toxic" environment is thought to be an important contributor to obesity (Battle & Brownell, 1996). The toxic environment includes the socioenvironmental factors that lead to overeating and physical inactivity (Nestle & Jacobson, 2000). Obesity among Aboriginal populations is thought to be the result of "westernization" or rapid changes in lifestyle, especially with respect to diet and physical activity (Harris, et al., 1997; Kuhnlein & Receveur, 1996; Young, 1994).

Socioeconomic status is inversely related to obesity among women, with women of lower socioeconomic status more likely to be obese (Sobal & Stunkard, 1989; Wardle, Waller, & Jarvis, 2002). Food insecurity has a paradoxical relationship with obesity among women (Townsend, Peerson, Love, Achterberg, & Murphy, 2001). Women with mild and moderate food insecurity are more likely to be overweight than those who are food secure. Psychosocial factors including stress and emotions also affect body weight (Greeno & Wing, 1994; Korkeila, Daprio, Rissanen, Koskenvuo, & Sorensen, 1998; Laitinen, Ek, & Sovio, 2002; Macht & Simons, 2000).

In view of the negative consequences of excessive prenatal weight gain for both mother and infant, and the paucity of studies examining its determinants, further research

is vital. Qualitative research in particular helps describe and explore phenomena that are poorly understood (Marshall & Rossman, 1995) such as excessive prenatal weight gain. Qualitative research can gain deep insight into the unique challenges related to prenatal weight gain among Aboriginal women. Aboriginal peoples in Canada have poorer health status compared to the general Canadian population as a result of inequities in opportunities for health and in socioeconomic conditions (Health Canada, 1999a). Young Aboriginal mothers especially are faced with socioeconomic challenges (Hull, 2001) that have implications for health. Qualitative research can explore the phenomenon of excessive prenatal weight gain in the context of Aboriginal women's life circumstances.

## A Health Promotion Perspective

Prenatal weight gain was examined through a health promotion perspective. Health promotion is defined as "the process of enabling people to increase control over, and to improve, their health" (World Health Organization, 1986, p.1). In a health promotion perspective, health issues are addressed in context and health is understood to be influenced by the interaction between individual, social, and environmental factors (Canadian Public Health Association, 1996). Psychosocial risk factors such as a lack of social support, low perceived power, and self-blame, and socioenvironmental risk conditions such as poverty, low educational and occupational status, and inadequate access to food, are thought to be important determinants of health (Labonte, 1993). The ultimate goal of health promotion is to increase health expectancy, and to reduce health inequities between groups (World Health Organization, 1997). Such disparities in health

and well-being continue to exist for Aboriginal Canadians compared to the general Canadian population (Royal Commission on Aboriginal Peoples, 1996b).

A health promotion perspective is congruent with Aboriginal people's view of health as being influenced by "a wide range of interconnected factors, including mental, physical, spiritual and emotional influences, as well as family and community contexts" (Health Canada, 2003b, p.4). The Report of the Royal Commission on Aboriginal Peoples (1996b) concluded that the factors contributing to the health of Aboriginal peoples are social, economic and political, and not purely biomedical. In order to influence health, fundamental improvements in the life circumstances of Aboriginal people are required (Royal Commission on Aboriginal Peoples).

Although lifestyles and individual health practices have traditionally been the target of health promotion strategies, it is now widely accepted that the broad, interrelated socioenvironmental determinants of health must also be considered within a broad concept of health promotion. Health Canada (2000) has identified the following as the major determinants of health for Canadians: income and social status; social support networks; education; employment and working conditions; physical environments; biology and genetic endowment; personal health practices and coping skills; health services; culture; gender; and social environments. Poverty is considered the greatest threat to health (World Health Organization, 1997). Strategies to improve health include much more than promoting individual behaviour change, but rather include creating supportive environments and building healthy public policy, among others (World Health Organization, 1986).

A health promotion approach was used to study excessive prenatal weight gain by examining its broad socioenvironmental determinants in addition to women's individual health practices. Prenatal weight gain was understood within the context of Aboriginal women's life circumstances and the ensuing recommendations reflect health promotion strategies.

## An Asset-Based Approach

An asset-based approach was used in addition to a health promotion approach in examining prenatal weight gain. Community development and health programs have traditionally used an approach that focuses on the needs, deficiencies, and problems of a community (Ammerman & Parks, 1998; Kretzman & McKnight, 1993). While this deficits approach may help bring attention, resources, and funding into a community, it can also have negative affects (Ammerman & Parks). For instance, it can result in community members believing that they are deficient and victims, unable to take control of their own lives and futures (Kretzman & McKnight). Providing funding and resources based on deficiencies also creates the perception that only outside experts can provide help (Kretzman & McKnight). Thus, residents come to rely on outside health and service providers. Kretzmann (2000) suggested that needs-based approaches view communities as "a collection of needs, problems and deficiencies, and that they produce mostly needy and unhealthy people who represent an endless supply of clients and patients for the helping and healing professions." He emphasized that with this view, the capacities of residents and communities will not be recognized and thus the major health determinants

such as individual behaviour, social relationships, and environmental and economic development will not be affected.

Asset-based approaches which focus on uncovering a community's capacities, assets, and strengths provide alternatives to the deficits approach (Kretzman & McKnight, 1993). Rather than focusing on what a community lacks, asset-based approaches focus on the resources a community and its members already have which can potentially be drawn upon to improve health (Lapping et al., 2002). Asset-based approaches view communities more holistically, recognizing that they have challenges and difficulties but also have strengths and resources (Kretzmann, 2000).

Positive deviance is an asset-based approach which is based on the belief that solutions to community problems already exist within the community (Sternin, Sternin & Marsh, 1998). Positive deviance approaches seek to uncover the "indigenous wisdom in community people as well as unique coping skills which ensure their survival in very difficult situations" (Sternin et al., p.34). A positive deviance approach examines why some people have good outcomes despite adversity (Lapping et al., 2002). For instance, Ahrari et al (2002) conducted a positive deviance inquiry to determine the factors associated with successful pregnancy outcomes in Egypt despite limited resources. The authors concluded that a positive deviance inquiry is useful to identify behaviours and conditions which may lead to improved perinatal health.

Using an asset-based approach to understand prenatal weight gain enabled the researcher to identify positive factors that promote appropriate weight gain. This was achieved by not only examining excessive prenatal weight gain, but also examining the positive influences on normal weight gain. In other words, the research explored the

reasons that some women are able to gain normal weight during pregnancy when faced with similar life contexts as those with excessive weight gain.

## Purpose

The purpose of the proposed study was to understand the personal and environmental determinants of prenatal weight gain, and specifically excessive prenatal weight gain, among Aboriginal women from a rural, Southern Alberta First Nations community. The information gathered will inform prenatal practice in the community in order to better help women achieve appropriate weight gain during pregnancy.

## Research Questions

In order to gain a rich understanding of appropriate and excessive weight gain in pregnancy, the present study examined characteristics (diet, physical activity, stress, body image, social support, and beliefs related to prenatal weight gain) that distinguish women who gain appropriate weight from those who gain excessive weight. The research also examined women's perspectives about the facilitators and barriers to gaining healthy weight during pregnancy. The research questions are as follows:

1. What characteristics (diet, physical activity, stress, body image, social support, and beliefs related to prenatal weight gain) distinguish women who gain appropriate weight during pregnancy from those who gain excessive weight?
2. From the perspective of Aboriginal women, what is facilitating and/or hindering appropriate prenatal weight gain?

# CHAPTER 2:

# LITERATURE REVIEW

This review of the literature will provide background information on the health and socioeconomic conditions of Aboriginal populations and will explore the research relating to excessive prenatal weight gain. Specifically, what is known about the prevalence, consequences, and determinants of excessive prenatal weight gain will be discussed. It is evident that there is limited literature on the determinants of excessive prenatal weight gain; thus, the determinants of obesity are also discussed to provide insight into the influences on excessive weight gain in pregnancy.

## Health and Socioeconomic Conditions of Aboriginal Populations

There continues to be health and socioeconomic disparities among Canadians of Aboriginal descent compared to the general Canadian population (Royal Commission on Aboriginal Peoples, 1996b). According to the Royal Commission on Aboriginal Peoples, the gap in health and well-being between Canadians of Aboriginal and non-Aboriginal descent "remains stubbornly wide" (p.108). The Commission concluded that "no matter which diseases and problems of social dysfunction are plaguing Canadians generally, they are likely to be more severe among Aboriginal people" (p. 201).

### *Health of Aboriginal Populations in Canada*

Aboriginal populations have undergone an "epidemiologic transition" characterized by a decline in the incidence of infectious diseases, followed by a rise of chronic, non-communicable diseases such as obesity, diabetes, and cardiovascular disease

(Harris et al., 1997; Young, 1994). Diabetes and heart disease are regarded as "new" diseases among Aboriginal populations (Health Canada, 1999a). Harris et al. proposed that current health issues faced by Aboriginal populations are the result of "dramatic changes in lifestyle [that] have taken place in Native communities across North America over the past 50 years, impacting profoundly on the social, environmental, and health status of Native people" (p.185). In other words, such diseases are the result of the adoption of westernized lifestyles and the loss of traditional activities among Aboriginal peoples.

The First Nations and Inuit Regional Health Survey found a substantially higher prevalence of self-reported diabetes, heart problems, cancer, hypertension, and arthritis/rheumatism among Aboriginal populations compared to the general Canadian population (First Nations and Inuit Regional Health Survey National Steering Committee, 1999). Particularly alarming is the high rate of diabetes (mainly type 2) among Aboriginal women, which is 5.3 times higher than the Canadian average. Data from the Canadian Mortality Database revealed that Aboriginal women living on reserves have a 5-fold greater risk of dying from diabetes compared to Canadians in general (Mao, Moloughney, Semenciw & Morrison, 1992). In a review of the status of the type 2 diabetes epidemic in Canada, Young, Reading, Elias, and O'Neil (2000) concluded that its prevalence is still on the rise in many First Nations communities.

Obesity is an important contributor to the risk of developing type 2 diabetes (Kumanyika et al., 2002; Mensink et al., 2003) and there is a high prevalence of obesity among Aboriginal populations (Katzmarzyk & Malina, 1998). Katzmarzyk and Malina compared a relatively small sample of Canadians of Aboriginal and European ancestry

from Northern Ontario and found that the prevalence of obesity and subcutaneous fatness were greater among First Nations Canadians, and obesity was especially high among First Nations women (60%). Body fat was also more centrally distributed among Aboriginal Canadians which is associated with a higher risk of diabetes, coronary heart disease, stroke, and breast cancer among other health issues (Ashwell, 1994).

### *Determinants of Health*

Aboriginal peoples in Canada face a host of inequities in opportunities for health and in socioeconomic conditions that contribute to poorer health status compared to the general Canadian population (Health Canada, 1999a). The socioeconomic environment is considered a strong predictor of health status (Health Canada, 1999a). Inequities experienced by Aboriginal peoples include lower quality housing, poorer physical environments, lower education levels, lower socioeconomic status, fewer employment opportunities, and weaker community infrastructure (Health Canada, 2003b). Among Aboriginal populations in 1995, the average employment income was approximately 1.5 times lower than the national average, and 44% of the Aboriginal population was living below Statistics Canada's low income cut-offs compared to 20% of the total Canadian population (Health Canada, 1999a).

The unemployment rate for First Nation people is two times greater than for Canadians in general (Health Canada, 2003a). When education attainment indicators (e.g. secondary school completion, postsecondary education admission) are considered, First Nations people rate lower than other Canadians (Health Canada). However,

improvements in educational attainment have occurred. For instance, more First Nations students are attending school until grade 12 (Health Canada).

In 1996, the prevalence of single mother families among Registered Indian populations was about two times higher than among other Canadian families (Hull, 2001). Young Aboriginal mothers (15-24 years old) were over three times more likely to be single mothers compared to other young Canadian women. Approximately one in three Aboriginal mothers in the 1996 Census were lone parents compared to one in six mothers in the general Canadian population (Health Canada, 2003a).

Single Aboriginal mothers experience economic disadvantages such as problems in the labour market and low family income to a greater degree than other single Canadian mothers (Hull, 2001). Among single Aboriginal mothers, the unemployment rate was 30% compared to 18% among other single mothers in 1996. As well, compared to other single mothers, more Aboriginal mothers relied on government transfer payments (72% compared to 49%) as their major source of income (Hull).

It is thought that current social issues among Aboriginal populations are largely the result of past policies of domination and assimilation (Royal Commission on Aboriginal Peoples, 1996b). For instance, residential schools for Aboriginal children, where attendance was mandatory, suppressed Aboriginal languages and customs (Royal Commission on Aboriginal Peoples, 1996a). These schools resulted in broken bonds between Aboriginal children and their families and nations. The Royal Commission on Aboriginal Peoples suggested that "many Aboriginal people are suffering not simply from specific diseases and social problems, but also from a depression of spirit resulting

from 200 or more years of damage to their cultures, languages, identities and self respect" (Royal Commission on Aboriginal Peoples, 1996b, p.109).

Research is needed in order to understand and address the unique health and socioeconomic concerns that face Aboriginal populations, and particularly Aboriginal women. Cultural beliefs and values, and the traditional views of Aboriginal people pertaining to health must be respected and considered in research and health services involving Aboriginal populations. One health concern facing Aboriginal women that requires research attention is excessive weight gain during pregnancy.

## Prenatal Weight Gain

Health Canada's recommendations for appropriate weight gain in pregnancy (Health Canada, 2002) are based on the Institute of Medicine (IOM) guidelines issued in 1990 (IOM, 1990). After reviewing epidemiological and clinical evidence regarding the effects of weight gain on the health of mothers and their infants, the IOM concluded that the target range for healthy prenatal weight gain should be based on prepregnancy body mass index (BMI). BMI ($kg/m^2$) assesses weight in relation to height. For each of the BMI categories (low, normal, and high), a slightly different range of weight gain is recommended for pregnancy. Women in the high BMI group (overweight) should gain less weight than those in the low (underweight) or normal group.

The Canadian recommendations were adapted from the IOM guidelines to account for the slight differences in Canadian BMI categories (Health Canada, 2002). The Canadian prenatal weight gain recommendations are as follows: 12.5 to 18 kg for underweight women (BMI<20); 11.5 to 16 kg for normal weight women (BMI 20-27);

and 7 to 11.5 kg for overweight and obese women (BMI>27) (Health Canada). The IOM suggested a weight gain of 7 kg for obese women (BMI>29) due to a paucity of data supporting an upper limit (IOM, 1990). However, more recent studies have indicated that an upper limit of 11.4 to 11.5 kg may be optimal for obese (Edwards et al., 1996) and morbidly obese women (BMI>35) (Bianco et al., 1998).

### *Excessive Prenatal Weight Gain*

Prenatal weight gain above the recommended guidelines has health implications for both mother and infant (IOM, 1990). The following sections will discuss the rates of excessive prenatal weight gain and its association with pregnancy complications, high birth weight, and postpartum weight retention. Studies reviewed by Abrams et al. (2000) that examined fetal and maternal outcomes related to the IOM's weight gain recommendations consistently indicated a greater risk of macrosomia (high birth weight), cesarean delivery, and post-partum weight retention with excessive prenatal weight gain. The authors concluded that "weight gain within the IOM's recommended ranges is associated with the best outcome for both mothers and infants" (Abrams et al., p.1233). However, they also concluded that "weight gain in most pregnant women is not within the IOM's ranges" (Abrams et al., p.1233) and many women over-gain.

Few studies were found on excessive weight gain in pregnancy among Aboriginal peoples. It should be noted that the studies pertaining to the general population or other Aboriginal populations included in this literature review are not necessarily representative of First Nations people in the Southern Alberta First Nations community involved in the present research. Aboriginal populations have unique cultures, languages,

traditions, and health issues, thus generalizations of study findings in the general population or other Aboriginal populations may not be appropriate.

*Rates of Excessive Prenatal Weight Gain*

Rates of excessive prenatal weight gain among Canadian or American Aboriginal populations or the general Canadian population have not been determined. However, American studies have found that 33.6 to 43% of white, black, and Hispanic women have excessive prenatal weight gain (Caulfield et al., 1996; Cogswell et al., 1999; Lederman et al., 1997). Overweight and obese women are especially likely to over-gain (Lederman et al., 2002). A recent study of a small sample of minority, low-income women found that 67% of normal weight women and 100% of overweight and obese women gained excessive weight during pregnancy based on the IOM guidelines (Lederman et al., 2002).

*Pregnancy Complications*

The risk of cesarean delivery has been found to increase linearly with increasing prenatal weight gain, independent of infant birth weight (Witter et al., 1995); and the rate of cesarean delivery is significantly higher among women who gain excessive weight in pregnancy (Johnson et al., 1992; Young & Woodmansee, 2002). Johnson et al. reported that unscheduled cesarean sections and fetal macrosomia (high birth weight) increased almost simultaneously in relation to increasing gestational weight gain. The authors concluded that increased gestational weight gain results in increased fetal macrosomia which then leads to increased rates of cesarean sections. Infant birth weight and prenatal weight gain are discussed in the following section. In addition to cesarean sections,

increased prenatal weight gain has also been associated with other labour abnormalities such as prolonged phases of labour and failure to progress (Johnson et al., 1992; Young & Woodmansee, 2002).

*High Birth Weight*

Several studies examining fetal macrosomia have found an association with prenatal weight gain (Bianco et al., 1998; Caulfield et al., 1998; Cogswell et al., 1995; Edwards et al., 1996; Johnson et al., 1992). Prenatal weight gain is positively, linearly associated with birth weight (Edwards et al.; Johnson et al.) and the risk of delivering a high birth weight infant (>4000g) (Caulfield et al.). The risk of delivering a high birth weight infant increases with increasing weight gain as well as with excessive weight gain (Bianco et al.; Caulfield et al.; Cogswell et al.). It should be noted that prenatal weight gain below the IOM's recommended ranges (IOM, 1990) is associated with low birth weight or small-for-gestational-age infants (Abrams et al, 2000). Thus, it is important that women gain within the recommended ranges to promote optimal fetal growth.

*Postpartum Weight Retention*

Numerous studies have reported that gestational weight gain is associated with postpartum weight retention as well as with an increased risk of becoming overweight in non-Aboriginal populations (Keppel and Taffel, 1993; Gunderson & Abrams, 2000; Lederman et al., 1997; Ohlin & Rossner, 1990; Scholl et al.,1995). Ohlin and Rossner found a significant positive relationship between gestational weight gain and post-partum weight retention in a large sample of women. One year after delivering, 14% of women

gained 5 kg or more compared to their prepregnancy weight, and pregnancy weight gain was the factor with the highest correlation to post-partum weight retention. Keppel and Taffel found that 61% of black women and 35% of white women who gained more than the recommended weight retained 4.1 kg (9 lbs) or more, 10-18 months after delivery.

Scholl et al. (1995) studied a relatively small sample of low-income, primarily minority women who began pregnancy at a normal weight. Women who gained excessive weight during pregnancy retained approximately 40% of the weight and had significantly greater skinfold thicknesses at 6 months postpartum compared to women who had moderate or low gains. As well, excessive weight gain in pregnancy resulted in a more than twofold increase in the risk of becoming classified as overweight. At 6 months postpartum, 31.2% of women who gained excessive weight in pregnancy had an increase in their BMI category from normal to overweight. Women were followed for only 6 months post-partum, thus longer-term weight retention was not assessed.

In the aforementioned studies, it is unknown whether weight several months after pregnancy was the result of the retention of gestational weight as opposed to lifestyle changes in the postpartum period which may cause increases in weight after pregnancy. In a prospective study, Olson, Strawderman, Hinton and Pearson (2003) examined some of the postpartum lifestyle factors associated with weight change. They found that exercise and dietary intake in the postpartum period as well as gestational weight gain were significantly associated with major weight increases (4.55 kg or more) from early pregnancy to 1 year postpartum. Thus, diet and lower exercise frequency after delivery contributed to long term weight retention; however, prenatal weight gain was also an important contributor to weight retention. In this study, lower income women who

gained more weight than the IOM recommendations were two times more likely to have major weight gain compared to higher income women who gained more than the IOM recommendations.

*Body Image*

Pregnancy is a time of rapid body shape change and weight gain, and thus has potential implications for women's body image satisfaction. No studies were found that examined body image in pregnancy among Aboriginal women. Literature among other populations has found variable associations between body image and prenatal weight gain, with some reporting that pregnant women have a negative body image (Armstrong & Weijohn's, 1991; DiPietro, Millet, Costigan, Gurewitsch, & Caulfield, 2003; Fairburn & Welch, 1990; Fox & Yamaguchi, 1997; Goodwin, Astbury, & McMeeken, 2000) and others reporting that they have a more positive body image in pregnancy (Clark & Ogden, 1999; Davies & Wardle, 1994; DiPietro et al).

Studies have found that body image satisfaction is lower during pregnancy compared to prepregnancy (Goodwin et al., 2000) and decreases from early to late pregnancy (Fairburn, Stein, & Jones,1992). DiPietro et al. (2003) found that women who gained more weight expressed more negative body image attitudes; however, even women with normal weight gain had negative attitudes about weight gain. Fairburn and Welch (1990) found that during pregnancy, 72% of women had a "definite fear that they would not be able to return to their former weight following pregnancy" (p.156). As well, 40% were afraid that they would gain too much weight, and 24% were distressed by their weight gain.

Another study found differences in responses to weight gain and body changes between normal and overweight women (Fox & Yamaguchi, 1997). Overweight women were more likely to have a positive change in body image whereas normal weight women were more likely to have a negative change. Although overweight women's change in body image was in a positive direction, they still had a significantly more negative body image than women of normal weight.

In contrast to the studies that suggest pregnancy is associated with a more negative body image, Clark and Ogden (1999) found that pregnant women had greater satisfaction with their body shape compared to a non pregnant control group. Davies and Wardle (1994) also compared pregnant and non-pregnant women's body images and found that pregnant women made fewer attempts to control their weight and were more accepting of their body size. In fact, pregnant women had significantly less dietary restraint, and fewer reported dieting. Less than 25% of pregnant women were upset about gaining weight.

Several studies noted that pregnancy may be viewed as a "license not to worry about weight" (Fairburn & Welch, 1990, p.158), or a socially acceptable reason to be fat (Wiles, 1993). Fox and Yamaguchi (1997) reported that overweight women who had positive changes in body image felt less self-conscious and free of the stigma of being overweight. "They felt that being pregnant allowed them to be overweight instead of trying to attain society's ideal female form" (Fox & Yamaguchi, p.39). Women in Wiles' study felt less pressure to be thin when they were pregnant. Fairburn and Welch found that some women (30%) were less concerned than usual about their weight during pregnancy, and almost half (46%) were not concerned at all about their weight gain.

Few studies have examined body image or weight perceptions in Aboriginal populations in general, let alone in pregnancy. It has been suggested that obesity is viewed differently among different cultures, and may not be regarded as a "health problem" (Young, 1996). Aboriginal cultural influences on weight are evident in Gray-Donald et al.'s (2000) findings that Cree communities believe that "being plump is desirable" (p.1250) and weight gain at regular intervals is important. As well, Gittelshohn et al. (1996) studied body image in Ojibway-Cree communities in Northern Ontario and found that Cree women had a larger ideal figure than Western populations. Marchessault (1995) suggested that weight perception in Aboriginal persons is an understudied topic despite the link between perceptions of weight issues and behaviours including eating and physical activity. In-depth qualitative studies would provide useful insight into the cultural beliefs about prenatal weight gain.

*Implications of Excessive Prenatal Weight Gain for Aboriginal Populations*

The problems associated with excessive prenatal weight gain are particularly concerning for Aboriginal populations. The association between excessive prenatal weight gain and post-partum weight retention is worrisome in view of the already high prevalence of obesity among Aboriginal women (Katzmarzyk & Malina, 1998). Weight gain in pregnancy may worsen weight status among Aboriginal women who are already overweight or obese and may cause women who are of normal prepregnancy weight to become overweight or obese. Excessive weight gain in pregnancy is an important contributor to obesity among women (Cogswell et al., 2001). Thus, efforts to prevent

excessive weight gain in pregnancy are imperative to curb the high rates of obesity among Aboriginal women and its ensuing health complications.

The health implications of obesity are particularly concerning for Aboriginal women. Obesity is an important risk factor for the development of type 2 diabetes (Kumanyika et al., 2002; Mensink et al., 2003), hypertension, and cardiovascular disease (Feig & Naylor, 1998). The prevalence of type 2 diabetes is alarmingly high among Aboriginal women (First Nations and Inuit Regional Health Survey National Steering Committee, 1999) and Aboriginal people living on reserves have a substantially higher risk of mortality from diabetes compared to other Canadians (Mao et al., 1992). Obesity also leads to important maternal and fetal complications in pregnancy (Galtier-Dereure, Boegner, & Bringer, 2000).

The association between excessive prenatal weight gain and high birth weight is also important for Aboriginal populations. Studies have reported high rates of macrosomia among Aboriginal populations (Caulfield, Harris, Whalen & Sugamori, 1998; Rodrigues et al., 2000) and the rate of high birth weight is higher among Aboriginal populations compared to the general Canadian population (Health Canada, 2003a; Rodrigues et al.). Health Canada reported that of 8,125 First Nations births in 1999, 22% were considered high birth weight (≥4000g). This is almost twice the rate of high birth weight for Canadians in general which was 12.2% for 1992 to 1996. Other studies have reported high birth weight rates of 29 to 34.3% among Aboriginal populations (Caulfield et al.; Rodrigues et al.). With higher birth weight, there is an increased incidence of potentially lethal or handicapping conditions such as severe

asphyxia, abnormal cerebral signs, convulsions, meconium aspiration, and skull fracture (Boyd, Usher, & McLean, 1983).

### *Determinants of Excessive Prenatal Weight Gain*

Despite the health implications and prevalence of excessive weight gain in pregnancy, there is limited literature on its determinants. A qualitative study that examined overweight women's views of appropriate weight gain in pregnancy provides some insight into excessive prenatal weight gain (Wiles, 1998). The sample consisted of women of various social classes. Findings indicated that although women wanted to return to their prepregnancy weight, some women lacked confidence in their ability to control prenatal weight gain and felt that large weight gains were inevitable. Their unborn infant's health was a central concern for women's decisions about appropriate weight gain. The author suggested that health professionals need to explore overweight women's beliefs about appropriate weight gain in pregnancy.

In a small study of 115 French-speaking Quebec women, Strychar et al. (2000) found that women who gained excessive weight in pregnancy had a higher prepregnancy BMI, less favorable attitude towards their weight gain, less knowledge about the importance of not gaining excessive weight in pregnancy, and were more concerned about their weight. In contrast, women who gained appropriate weight were more likely to perceive that gaining appropriate weight would allow them to have a healthy baby, to have a baby of normal weight, to more easily return to their prepregnancy weight, and to feel fit. As well, they were more likely to perceive that dietary habits, physical activity,

and stress levels have an influence on weight gain during pregnancy. Most women in the study were married and had a high-school education.

In addition to Strychar et al. (2000), Caulfield et al. (1996) and Olson and Strawderman (2003) found that women who over-gained had a higher prepregnancy BMI. Olson and Strawderman (2003) found that women with a high prepregnancy BMI were about 5 times more likely to gain more than the IOM's recommended range compared to women with a normal BMI. In Caulfield et al.'s study, women who over-gained also tended to be primiparous, taller, white, and hypertensive.

*Medical Advice about Weight Gain*

Studies have indicated that women are more likely to gain weight within the recommended ranges if their physician instructs them to do so (Cogswell et al., 1999; Taffel et al., 1993). In a survey of mainly white, middle class women, Cogswell et al. found that 27% of women reported that they had not received any medical advice about weight gain. Of those who received advice, 22% were advised to gain more weight than the IOM recommendations and most women to receive advice above the IOM recommendations were overweight. Thus, approximately half of the participants reported they received either no advice or inappropriate advice about prenatal weight gain. Advised weight gain was strongly associated with actual weight gain, and receiving no advice was associated with weight gain outside the recommendations, with more women gaining too much weight (44.8%) than too little weight (25%). Strychar et al. (2000) found that women who gained excessive weight in pregnancy were less likely to have

spoken to a physician about weight gain at the beginning of their pregnancy (before 16 weeks gestation).

*Prenatal Care*

Excessive weight gain has not been examined in relation to prenatal care (e.g., number of visits and timing of first visit). In view of the apparent link between professional advice about weight gain and actual weight gain, prenatal care is likely to influence weight gain. It is generally accepted that prenatal care has a beneficial impact on pregnancy outcome, whether by the diagnosis and treatment of complications or by influencing modifiable maternal risk factors (Mustard & Roos, 1994). A study of 12,646 pregnancies in Winnipeg found that 8.9% of women received inadequate prenatal care as defined by initiation later than the second trimester or an insufficient number of prenatal care contacts (Mustard & Roos). Despite universal health insurance, women in the lowest income group had consistently and substantially poorer utilization compared to median and high income women. Lower income women had an average of 1.5 fewer visits during their pregnancies and first sought care an average of 1.5 weeks later.

A study of 174,100 single births in Hawaii to mothers of white, Hawaiian, Filipino, or Japanese ethnicity found that only 60.3% used prenatal care adequately, and 7.6% had inadequate use or no prenatal care (Mor, Alexander, Kogan, Kieffer, & Hulsey, 1995). Over one quarter of women failed to initiate prenatal care in the first trimester, well below the U.S. Year 2010 Objective for 90% of women to initiate prenatal care in the first trimester (U.S. Department of Health and Human Services, 2000). There is a

high level of insurance coverage in Hawaii, making the findings somewhat more comparable for Canadians.

*Eating Behaviour*

Canadian guidelines recommend a dietary increase of 100 kcal in the first trimester and 300 kcal in the second and third trimesters (Health and Welfare Canada, 1990). Thus, it is normal and recommended for women to consume slightly more than usual during pregnancy. Researchers have found that weight gain is significantly, positively associated with energy intake and energy-adjusted protein and fat intake during pregnancy (Lagiou, et al., 2004).

Studies of eating habits in pregnancy among non-Aboriginal populations have found that women tend to eat more and have less dietary restraint during pregnancy (Clark & Ogden, 1999; Conway et al., 1999; Davies & Wardle, 1994; Fairburn & Welch, 1990). Fairburn and Welch (1990) found that overeating during pregnancy is common. A quarter of women in their study reported episodes of significant overeating during pregnancy, and many of these women gained excessive weight (over 9.1 kg or 20 lbs). Overeating was explained by the women to be the result of an increase in hunger, eating in response to a negative mood, or overeating because of lower dietary restraint.

Olson and Strawderman (2003) found that change in the quantity of food consumed is significantly related to weight gain and the risk of gaining excessive weight. In fact, women who ate much more food compared to prepregnancy were 2.35 times more likely to gain excessive weight compared to women who ate only a little more. The researchers also found that women gained significantly less weight when they consumed

three or more servings of fruits and vegetables per day compared to those who consumed fewer servings.

Several studies have found a lower level of dietary restraint among pregnant women compared to non-pregnant controls (Clark & Ogden's 1999; Davies & Wardle, 1994). Clark and Ogden suggested that "pregnancy legitimizes eating for women" (p. 24). Studies have also found that dieting is uncommon during pregnancy (Davies & Wardle; Fairburn & Welch, 1990). Davies and Wardle found that dieting behaviour dropped significantly among pregnant women from 46% before pregnancy to only 1% during pregnancy. Significantly fewer pregnant women were dieting (1%) compared to non-pregnant controls (44%). Fairburn and Welch (1990) found that 6% of women in their study were dieting during pregnancy.

*Cravings.* Dietary cravings are common in pregnancy but have not been studied in relation to weight gain (Fairburn & Welch, 1990; Pope, Skinner, & Carruth, 1992). Fairburn and Welch reported that 44% of women in their study described having specific cravings. The cravings occurred at any point during pregnancy and usually lasted only a few months. In a study of 97 pregnant adolescents, Pope et al. found that 97% had food cravings. The types of craved foods most commonly reported were sweets (especially chocolate), fruit and fruit juices, high-protein main dishes, pickles, ice cream, and pizza. When having a craving, most adolescents actually consumed the craved food. Not surprisingly, those who craved sweets consumed significantly more sugar and energy in their diet compared to those who did not crave sweets. As well, those who craved chips or other salty snacks had higher sodium, fat, and energy intake than those who did not crave salty items.

*Nutrition Knowledge.* Few studies have assessed women's knowledge about appropriate nutrition during pregnancy and its relation to prenatal weight gain. Fowles (2002) examined nutrition knowledge and dietary intakes among middle and low-income American women. Women with middle income attended childbirth education classes and those with low income attended a free prenatal clinic. Findings indicated that the majority of women had inadequate knowledge of general nutrition and dietary intakes that did not meet the recommendations for pregnancy. For instance, fat intake was higher than recommended. Fowles noted significant differences between nutrition knowledge and actual intakes for breads, fruits and vegetables, but not for meat and milk servings. The women ate more bread and fewer fruits and vegetables than recommended.

Anderson, Campbell, and Shepherd (1995) assessed nutrition knowledge and dietary intakes of pregnant women who attended a tailored nutrition education program compared to those who did not receive the intervention. The women in the intervention group were motivated and seeking health information. It was found that although nutrition knowledge was significantly higher among those in the intervention group, there were no differences in terms of attitudes about nutrition or actual dietary intakes between the groups. The authors concluded that "nutrition advice for pregnant women may have some impact on nutrition knowledge but has little effect on nutrient intake during pregnancy" (p.163). They suggested that "factors other than information alone are needed to bring about dietary change" (p.176).

*Physical Activity Behaviour*

Canadian recommendations for physical activity during pregnancy suggest that "in uncomplicated pregnancies, women with or without a previously sedentary lifestyle should be encouraged to participate in aerobic and strength-conditioning exercises as part of a healthy lifestyle" (Davies, Wolfe, Mottola, & MacKinnon, 2003, p.334). There are numerous benefits of physical activity during pregnancy for both mother and fetus (Clapp, 2000). These include limited gestational weight gain and fat retention, improved attitude and mental state, and easier labour, among others (Clapp). Exercise in early pregnancy has also been associated with fewer symptoms and discomforts in later stages of pregnancy (Sternfeld, 1997).

Clapp and Little (1995) found that women who participated in recreational exercise during pregnancy gained significantly less weight than those who discontinued exercise in pregnancy. Olson and Strawderman (2003) found that women who decreased their level of physical activity during pregnancy compared to those who maintained or increased their physical activity, gained significantly more weight. Women were 1.7 times more likely to gain more than the IOM's recommended amount when they decreased their level of physical activity during pregnancy compared to those who maintained or increased their activity.

Clark and Odgen (1999) found that women in their study had significantly reduced their level of physical activity compared to 3 months prior to pregnancy. Ning et al. (2003) found that about 61% of pregnant women participated in physical activity; however, non-white women were 40-60% less likely to be physically active during pregnancy compared to white women. The most common types of physical activity

included walking, swimming, gardening, and jogging. The authors reported that the strongest predictors of physical activity during pregnancy were being physically active during the year prior to pregnancy and being active as an adolescent. They also found that income and education were positively associated with physical activity.

Studies were not found on participation in physical activity among Aboriginal women during pregnancy. Gray-Donald et al. (2000) reported that Aboriginal women viewed physical activity during pregnancy as inappropriate. Thus, physical activity may be lower among some groups of pregnant Aboriginal women.

*Social Support*

Social support is an important psychosocial factor that influences health behaviours including eating and physical activity (Labonte, 1993). Support may consist of structural aspects such as marital status, number of support networks and frequency of social interactions, or functional aspects including emotional, tangible, and informational support (Callaghan & Morrissey, 1993). There are various ways in which social support may influence health: it may promote health by influencing thoughts, feelings, and behaviour; it may foster one's sense of meaning in life; or it may facilitate health promoting behaviours such as diet and exercise (Antonovsky, 1979; Callaghan & Morrissey; House, Landis & Umberson, 1988; Umberson, 1987). As well, it is thought that social support acts as a buffer against stressful life events (Callaghan & Morrissey).

Social support is an understudied area in relation to excessive prenatal weight gain; in fact, only one study was found to examine this relationship. Olson and Strawderman (2003) found that the association between low social support and prenatal

weight gain varied by women's prepregnancy BMI. Women who had a low, normal, or obese BMI and low social support had significantly higher weight gain compared to those with average or higher social support. In contrast, women with an overweight BMI and low social support gained significantly less weight compared to those with an overweight BMI and average or higher levels of support. Social support was assessed through questions about practical help received from friends and relatives and the number of people the women could obtain help from if needed. Although research on the impact of social support on excessive weight gain is limited, social support as well as other psychosocial factors are associated with low prenatal weight gain among white women (Hickey, Cliver, Goldenberg, McNeal, & Hoffman, 1995).

Social support is positively associated with health behaviours during pregnancy including eating and physical activity (Schaffer & Lia-Hoagberg, 1997; Walker et al., 1999). For instance, in Schaffer and Lia-Hoagberg's study, support from others (excluding partners) was significantly, positively associated with health behaviours such as nutritional intake (Schaffer & Lia-Hoagberg). In this study, others included mothers, siblings (mainly sisters), friends, and extended family. Few women listed health professionals as support providers. Pregnancy-specific support (having someone to talk to about the pregnancy and being provided with information that helps in pregnancy) was particularly associated with health behaviours. Other dimensions of support that were significantly related to health behaviours included affect (perception of being valued and loved), affirmation (feelings of belonging), and aid (concrete help). Although this study linked social support with health behaviours, it did not examine social support in relation to weight gain.

*Income*

Family income has been associated with weight gain and the risk of gaining excessive weight in pregnancy (Olson & Strawderman, 2003). Compared to women with higher incomes, women with low family incomes (less than 185% of the U.S. federal poverty line) were 2.6 times more likely to gain more weight than the IOM's recommendations. Low income has also been associated with poorer health behaviours during pregnancy, including eating and physical activity (Walker et al., 1999).

## Determinants of Obesity

In view of the gaps in the literature on the determinants of excessive weight gain in pregnancy, the obesity literature may be drawn upon. It is generally accepted that focusing on individuals' behaviour (diet and physical activity) is inadequate to prevent or treat obesity (e.g., Nestle & Jacobson, 2000). In addition, society's "toxic" environment must be considered (Battle & Brownell, 1996), including the "deeply rooted cultural, social, and economic factors that actively encourage overeating and sedentary behavior" (Nestle & Jacobson, 2000, p.18).

The toxic environment is one that exposes individuals to energy-dense, heavily advertised, inexpensive, and highly accessible foods (Battle & Brownell, 1996). Wadden, Foster and Brownell (2002) identified additional aspects of the toxic environment including the increase in fast food restaurants, large and growing portion sizes, minimarts in gasoline stations, soft drink contracts in schools, and potent food advertising. Such an environment is then combined with increasingly sedentary lifestyles (Wadden et al.) due to reliance on cars as well as entertainment such as television and

video games. Thus the increased energy intake promoted by the toxic environment is not offset by energy expenditure. It is the balance between energy consumed through food and drinks, and energy expended from metabolic and muscular activity that is necessary for obesity prevention (Nestle & Jacobson, 2000).

Egger and Swinburn (1997) proposed an ecological model to understand obesity. The model incorporates biological and behavioural as well as environmental influences on obesity which are mediated through energy intake and/or energy expenditure. Environmental influences include the macro-environment which determines the prevalence of obesity within a population, and the micro-environment which determines whether an individual is obese, along with biological and behavioural characteristics. The macro and micro-environments include physical, economic, and sociocultural influences. For instance, the economic environment influences obesity through food prices (macro) and family income (micro).

### *Obesity among Aboriginal Populations*

It is thought that obesity and other chronic diseases among Native Americans are the result of rapid changes in lifestyle, especially with respect to diet and physical activity (Kuhnlein & Receveur, 1996; Young, 1994). In other words, the result of societal "westernization", or the transition from a hunter-gatherer existence which involved high levels of physical activity, to a lifestyle of inactivity and excessive food intake (Harris et al., 1997).

A traditional diet is composed of culturally acceptable plant and animal foods harvested from the local, natural environment (Kuhnlein & Receveur, 1996) as opposed

to store-bought foods. Traditional food systems typically include a broad range of plant and animal species (Kuhnlein & Receveur) which contribute to complete diets with adequate fibre and mictronutrients, and limited saturated fat and refined carbohydrate (Eaton & Konner, 1985). The transition from a traditional food system to one containing more market foods has contributed to the rise in incidence of obesity, diabetes, and other chronic diseases (e.g., Kuhnlein & Receveur; Young, 1994). Patterns of food consumption vary among Canada's Aboriginal populations depending on geographic region and cultural tradition (Wein, 1994). The types and proportions of traditional foods used vary considerably among different Aboriginal populations (Wein). According to the Aboriginal Peoples Survey, only 15% of Aboriginal people obtain most or all of their meat and fish from hunting and fishing (Statistics Canada, 1993).

Along with dietary acculturation, Aboriginal people have adopted a more sedentary lifestyle (Kuhnlein & Receveur, 1996; Young et al., 2000). The Aboriginal Peoples Survey indicated that 54% of Aboriginal adults take part in leisure time physical activity in Canada (Statistics Canada, 1993). In comparison, statistics for Canadians in general indicate that 46% of the population aged 12 and over are at least moderately active in their leisure time (Statistics Canada, 2001).

### *Socioeconomic Status*

Studies have consistently reported that low socioeconomic status (SES) is a risk factor for obesity among women (e.g., Sobal & Stunkard, 1989; Wardle et al., 2002). In their review of the literature on SES and obesity, Sobal and Stunkard (1989) found that there was an inverse relationship between SES and obesity among women in developed

societies. The most frequently measured indicators of SES in the studies were income and education. Women with low SES were more likely to be obese. More recent studies have also indicated that the risk for obesity (BMI > 30) is greater for women with fewer years of education, poorer economic circumstances, and lower occupational status (Wardle et al., 2002). Another study showed that women of low employment status were 1.4 times more likely to be overweight compared to women of high employment status (Ball, Mishra, & Crawford, 2002).

The relationship between SES and obesity is particularly important for Aboriginal populations who generally have lower SES than other Canadians when considering education attainment, rates of unemployment, and employment income (Health Canada, 1999a; Health Canada, 2003a). In a study of 434 Inuit individuals in the central Canadian Arctic, Young (1996) found that lower education among women was associated with obesity.

One possible explanation for the link between socioeconomic status and obesity is related to the environment. For instance, Reidpath, Burns, Garrard, Mahoney, and Townsend (2002) found a dose-response between SES and the density of fast-food outlets in Melbourne, Australia. Individuals living in the poorest areas had a 2.5 times greater exposure to fast-food outlets than those living in the wealthiest areas. Aswell, Wamala, Wolk and Orth-Gomer (1997) explained a large part of the association between low SES and overweight and obesity in women through reproductive history (higher parity and earlier age at menarche), unhealthy dietary habits, and psychosocial stress (poor quality of life, low self-esteem, and job strain).

### *Food Insecurity*

Food security is defined as "access by all people at all times to enough food for an active and healthy life. Food security includes at a minimum a) the ready availability of nutritionally adequate and safe foods, and b) an assured ability to acquire acceptable foods in socially acceptable ways" (Anderson, 1990, p.1560). In contrast, food insecurity is when "the availability of nutritionally adequate and safe foods or the ability to acquire acceptable foods in socially acceptable ways is limited or uncertain" (Anderson, p.1560). Low-income families are most likely to be food insecure, or to have limited or uncertain access to food (Health Canada, 1999b). More Aboriginal families experience problems with food affordability than Canadian families as a whole, which is associated with higher levels of unemployment and lower incomes (Health Canada).

Food insecurity has a paradoxical relationship with obesity among women (Townsend et al., 2001). In a sample of 4537 American women (excluding homeless women), food insecurity was significantly and positively related to overweight status. Those who experienced mild and moderate food insecurity were more likely to be overweight than those who were food secure. The prevalence of overweight was 41% for those who were mildly food insecure and 52% for those who were moderately food insecure, compared to 34% for women who were food secure. Because food insecurity is more common among Aboriginal populations (Health Canada, 1999b), the association between food insecurity and obesity is an important consideration for Aboriginal women.

### *Stress and Emotions*

Eating and body weight are also affected by stress and emotions (Greeno & Wing, 1994; Korkeila et al., 1998; Laitinen et al., 2002; Macht & Simons, 2000). In a

longitudinal study, Laitinen et al. found that BMI was highest among stress-driven eaters (those who try to make themselves feel better by eating during a stressful situation). Stress-driven eating was significantly associated with obesity among women (BMI > 29.9). Stress-driven eaters ate sausages, hamburgers, pizza, and chocolate more often than others. The most important predictor of stress-driven eating among women was a lack of emotional support. Social support is thought to be protective in times of stress (Thoits, 1986).

## Summary

In summary, the literature suggests that excessive prenatal weight gain is associated with adverse health outcomes for both mother and infant. It is apparent that the literature includes mainly quantitative studies of the implications of excessive prenatal weight gain and there is a paucity of literature examining the determinants of excessive weight gain in pregnancy. There is also limited qualitative research pertaining to excessive prenatal weight gain. Although the obesity literature may provide insight into possible influences on weight gain in pregnancy, studies are needed to determine the specific influences on prenatal weight gain. Further research relating to excessive prenatal weight gain is vital given its negative consequences and the paucity of research examining its determinants. The behavioural, psychosocial, and socioenvironmental influences on excessive prenatal weight gain all require examination.

Very few studies have examined prenatal weight gain among Aboriginal women. Aboriginal populations and Aboriginal women in particular face socioeconomic challenges that influence health and generally have poorer health compared to other

Canadians. Excessive weight gain in pregnancy may contribute to health issues such as rates of obesity and type 2 diabetes for which the prevalence is already high among Aboriginal women. Research pertaining specifically to Aboriginal women is necessary to understand their unique experiences and challenges related to prenatal weight gain, and to prevent excessive prenatal weight gain and its resulting health implications.

The objectives of the present research study in a Southern Alberta First Nations community were as follows:

1. To determine the characteristics (diet, physical activity, stress, body image, social support, and beliefs about weight gain) that distinguish women who gain appropriate weight during pregnancy from those who gain excessive weight.
2. To understand women's perspectives on the facilitators and/or barriers to appropriate prenatal weight gain.

# CHAPTER 3:

# METHODS AND PROCEDURES

## Methodological Approach

The currently available literature on excessive prenatal weight gain is mainly quantitative in nature and has focused on the impact of excessive prenatal weight gain on health and pregnancy outcomes. Studies have indicated that many women gain excessive weight during pregnancy (Abrams et al., 2000; Caulfield et al., 1996; Cogswell et al., 1999; Lederman et al., 1997; Lederman et al., 2002) yet very little is known about the influences on excessive prenatal weight gain among Aboriginal women or women in general. Given the currently limited understanding, the present study aimed to both explore and describe the phenomenon of excessive prenatal weight gain. Exploratory research is appropriate in order to investigate phenomena that are poorly understood and to discover important factors related to phenomena; and descriptive research is useful to document relevant behaviours, beliefs, attitudes and structures related to a phenomenon (Marshall & Rossman, 1995). A qualitative approach is particularly valuable for research that is exploratory or descriptive (Marshall & Rossman) and can contribute valuable insight into the influences on excessive prenatal weight gain.

The present research used a qualitative approach to explore and describe women's perspectives about the barriers and facilitators to healthy weight gain as well as the characteristics that distinguish women who gain normal and excessive weight. Qualitative research explores life experiences such as prenatal weight gain from the perspective of participants (Morse & Field, 1995) and can lead to deep and detailed understanding of an issue (Morse & Richards, 2002). It is naturalistic inquiry which

examines "naturally occurring phenomenon in their naturally occurring states" (Patton, 1990, p.41) without a researcher's control or manipulation of the setting. In qualitative research, the setting and context in which participants operate are viewed as important in understanding behaviour (Marshall & Rossman, 1995).

Qualitative research is also holistic; phenomena are understood as a whole and are viewed as complex systems (Patton, 1990). The complexities of real world phenomena are not reduced to discrete variables or cause and effect relationships as in quantitative research (Patton, 1990). A qualitative approach was appropriate in order to examine prenatal weight gain among Aboriginal women in the context of their life circumstances.

## Design

The specific qualitative research design chosen to answer the research questions was an ethnography. Ethnographic research is a qualitative approach that elicits the emic or insider's perspective of a phenomenon (Fetterman, 1998). Ethnographic research explores and provides thick descriptions of the beliefs, practices, values, and behaviours embedded within a cultural group (Morse & Richards, 2002). It "explores phenomena within cultural contexts from the emic perspective" (Morse & Richards, 2002, p.49). LeCompte and Schensul (1999) defined culture as the "beliefs, behaviors, norms, attitudes, social arrangements, and forms of expression that form describable patterns in the lives of members of a community or institution" (p.21). An ethnographic study was fitting to understand the characteristics (e.g., beliefs and behaviours) of women who gain normal and excessive weight as well as to elicit their perspectives about the issue.

In view of the narrow scope of the research questions, a focused ethnography was conducted. Focused ethnographic studies elicit information on a specific topic or shared experience (Morse & Richards, 2002), and the topic may be selected prior to initiating the study (Muecke, 1994). A focused ethnography may be conducted with a sub-cultural group that shares some feature (Morse & Richards). The present study examined the specific topic of prenatal weight gain within the sub-cultural group of recently pregnant Aboriginal women from a Southern Alberta First Nations community.

The study used concepts from asset-based approaches such as positive deviance (Sternin et al., 1998). Rather than exploring only the factors that led to excessive weight gain, the study also examined the positive factors that promoted appropriate weight gain. In order to determine the characteristics that distinguished women who gained appropriate and excessive weight, a comparative research design was used. Comparative designs enable the researcher to determine similarities and differences between two groups (Morse & Richards, 2002). The groups that were compared were (1) Aboriginal women who gained an appropriate amount of weight during pregnancy and (2) those who gained excessive weight according to Canadian recommendations (Health Canada, 2002).

## Sample

### *Access to the Participants*

Staff at the prenatal clinic in the Southern Alberta First Nations community identified excessive weight gain in pregnancy as a health issue of concern. Prenatal staff wanted to better understand prenatal weight gain in order to help women achieve

appropriate weight gain. Thus, the researcher gained access to Aboriginal women through the prenatal clinic staff.

The prenatal nurses invited pregnant or recently pregnant women to participate in the study. Pregnant women were invited to participate if they were expected to deliver before December, 2003 and recently pregnant women were invited to participate if they had delivered after September, 2002. The nurses recruited the women when they conducted home pre or postnatal visits. Women were also recruited by the nurses when they brought their infants into the clinic for their immunizations. The nurses explained the study and obtained written, informed consent from women who were interested in participating as will be discussed in the *Ethical Considerations* section. This initial consent was for the woman's and her infant's chart to be reviewed, and for her to potentially be contacted by the researcher for an interview. Nurses kept a confidential list of the names of women who provided consent which was made available to the researcher in order to review charts.

The selection of participants to be interviewed will be discussed in the following section. Once it was determined which women would be invited to be interviewed, their contact information was obtained from their clinic chart. In order to organize interviews, the researcher contacted the women by telephone to set up a convenient interview time. For women who did not have telephones, the researcher or a clinic nurse set up an interview time through a home visit, which is the same booking procedure used by the prenatal clinic. The researcher had to rely on the clinic nurses to provide directions to women's homes, and in some cases the nurses had to escort the researcher to homes that

were difficult to locate. Written, informed consent was obtained by the researcher prior to beginning the interview session as will be discussed in *Ethical Considerations*.

### *Sampling Framework*

Sampling involved nonprobability, purposive sampling whereby the researcher decided on the purpose that participants were to serve, then selected participants accordingly (Bernard, 2000). The objective was to obtain a sample of women who gained either excessive or normal weight during pregnancy using the Canadian guidelines for healthy weight gain which are based on women's prepregnancy BMI category (Health Canada, 2002). Thus, participants were selected based on their prepregnancy BMI and their total weight gain during pregnancy. In order to select participants, the researcher reviewed women's clinic charts to obtain their prenatal weight gain and prepregnancy weight and height in order to determine their BMI. Prenatal weight gain was estimated by subtracting prepregnancy weight from the last recorded pregnancy weight (within 1 month of delivery).

When recruiting participants, the nurses obtained self-reported or measured height as height is not normally recorded in women's charts. Self-reported height was obtained during pre and postnatal visits which took place in women's homes, thus using proper equipment (stadiometer) to measure height was not feasible. Measured height was obtained for women who were recruited in the clinic. When interviews were conducted by the researcher, measured height was obtained to verify the women's BMI categories.

Women were also purposively selected in order to gain a sample of women who lived in the Aboriginal community as well as in surrounding areas. It was felt that

women living in the Aboriginal community and in surrounding towns may have different experiences related to prenatal weight gain.

### *Selection Criteria*

Aboriginal women included in the study met the following inclusion criteria: gained appropriate or excessive weight during pregnancy; had a singleton pregnancy; delivered after September, 2002 (1 year prior to the start of data collection); had a live birth; delivered at term; and participated in the community's prenatal program. Participants also had to be 18 years of age or older because younger teenagers have unique challenges and experiences that were beyond the scope of this research. No restrictions were made for the number of previous births. Women's eligibility was assessed by the researcher through screening their clinic charts.

### *Sample Size*

The sample included 13 women, 6 with normal prenatal weight gain and 7 with excessive weight gain. Data were collected until saturation occurred, that is, when "no new or relevant data emerge, when all avenues or leads have been followed, and when the story or theory is complete" (Mayan, 2001, p.10). Saturation was achieved when the categories were dense and the relationships between them were well-established (Mayan). Morse and Richards (2002) suggested that 30-50 participants are required to reach saturation in ethnographic research. However, because the study was a focused ethnography, with a specific topic, fewer participants were required. It was felt that after interviewing 13 women, data saturation had been achieved. The 13 participants

adequately represented women with normal and excessive weight gain, living in varied proximities to the Aboriginal community.

## Data Collection

### *Chart Reviews*

Medical chart reviews were completed in order to determine women's eligibility for the study, weight information, and demographic characteristics. Charts for all women who provided consent were reviewed in order to select women to be interviewed. Specifically, the information obtained from the women's charts included age, marital status, education level, number of previous births, pregnancy information such as weight gain, attendance at prenatal classes, and whether counselling from a dietitian was received, among other information. As well, infant charts were reviewed to obtain information about birth weight, length, gestational age, and delivery complications.

### *Interviews*

Individual, semi-structured interviews are appropriate for focused ethnographic research (Morse & Richards, 2002) and were the main data collection method in the present study. Focused ethnographic research does not require all of the data collection methods typically used in ethnography because of its narrower scope (Morse & Richards), thus interviews were sufficient for data collection. Semi-structured interviews enabled the researcher to gain a deep understanding of women's characteristics and perspectives. The use of semi-structured interviews allowed the researcher to maintain control and obtain specific information, but also allowed the interviewer or respondent

the freedom to follow new leads (Bernard, 2000). Individual interviews were appropriate because of the sensitive nature of the topic of weight gain (Horne, 1995).

Data collection involved two interviews conducted by the researcher: initial and follow-up. Procedures for obtaining informed consent will be discussed in *Ethical Considerations*. All but one participant completed both interviews. One woman did not wish to participate in the follow-up interview because of personal circumstances. The initial interviews lasted 60 to 90 minutes and the follow-up interviews lasted 30 to 50 minutes. Women were asked whether they would prefer to be interviewed in their home or at the prenatal clinic and most women chose to be interviewed in their home. Home visits are the usual means of delivering prenatal care and women do not consider the home visits to be an invasion of privacy. Prenatal staff said that women feel home visits are an expression of caring and appreciate receiving care in their homes where they feel comfortable.

For the initial interviews, an interview guide with mainly open-ended questions and planned probes and follow-up questions was used (Appendix A). Unplanned probes were also used to follow leads and gain further information from participants. Background and demographic questions were asked at the end of the initial interviews (Appendix B). Follow-up interviews were completed to obtain further information about responses provided in the initial interviews and to conduct participant checks. Follow-up interviews were also semi-structured and the questions were developed after analysis of the initial interviews. An interview guide was created specific to each participant, depending on their initial interview. During the interviews, the researcher wrote notes in order to identify points that required further exploration. After each interview, the

researcher wrote fieldnotes about the setting (e.g., the presence of children or other adults) and her general impression of the interview.

As a token of appreciation, each woman was given a $20 gift certificate for a local grocery store for each interview (initial and follow-up). These gift certificates were the same as those used for the Canadian Prenatal Nutrition Program which provides the certificates to prenatal clients, women who breastfeed, and women who bring their children to the clinic for immunizations.

Informal interviews were conducted by the researcher with three pre and postnatal staff members from the clinic in order to gain background information about the prenatal care program. Written, informed consent was obtained for these interviews as will be discussed in *Ethical Considerations*. For these discussions, the researcher took detailed notes as the sessions were not recorded. The researcher also wrote notes whenever she learned new information about prenatal care throughout the data collection process.

### *Recording Procedures*

All interviews with the women were tape-recorded with their consent which was recorded on the tape itself. The recorded interviews were transcribed verbatim soon after they were conducted. The transcripts included words as well as laughter, pauses, and "um's" or other vocal sounds. Overlapping talk, turn-taking (e.g., talk that is cut-off), and words that were over-stressed were also noted. Bolded font was used to indicate words that were over-stressed or emphasized and dashes were used to indicate talk that was cut-off. Names of spouses, children, friends, and health workers were omitted to prevent the women or health workers from being identified. In order to protect the

identity of physicians and nurses, their gender was not disclosed by using 'him/her' or 'he/she' for example. Square brackets were used to identify words that the researcher added to the transcript. In this report, '. . .' was used to indicate irrelevant text that was removed. All transcripts were checked against the recorded interviews to ensure accuracy.

### *Data Management*

In order to identify participants but ensure anonymity, codes were assigned to each woman's transcript. In the present report, pseudonyms were assigned to each woman. Two electronic copies of the interview data were created, and one hard copy was produced. The chart review data were not inputted to a computer, thus only the original, completed data collection forms were kept. The recorded interviews will be kept in a secure location for 5 years in accordance with University of Alberta regulations (University of Alberta, 2003).

## Data Analysis

Analysis of the interview data occurred concurrently with data collection. This allowed for categories and questions that emerged to be verified and pursued in subsequent interviews. Each interview was analyzed by the researcher as soon as possible after it was conducted. Ethnographic analysis leads to thick and rich descriptions by "summarizing, synthesizing, and extracting the essential features or characteristics of the situation" (Morse & Richards, 2002, p.150). The themes and categories were not predefined, but rather emerged from the data. The analyst put aside

her own knowledge about the issue and looked at the data with a fresh perspective. Horne (1995) stressed the importance of not having predefined ideas about the issue of interest.

The analysis of the interviews was based on Mayan's (2001) suggested procedures for latent content analysis. This type of content analysis is the "process of identifying, coding, and categorizing the primary patterns in the data" (Mayan, p.22). It involved examining passages in the data within the context of the data as a whole. The following steps, based on those proposed by Mayan, were conducted for both initial and follow-up interviews. (1) The interviews were read through in their entirety to gain a general understanding of the content. (2) They were coded for persistent words, phrases, themes, or concepts of interest by writing notes in the margins. The coding system used words or phrases as codes. Codes were initially written in the margins and were later transferred to the computer. (3) The data were then categorized. Passages relating to relevant categories were cut from the text and grouped into separate computer documents. Passages that fit in more than one category were copied and pasted into all appropriate documents. (4) Sub-categories were created by re-reading the data in each category and cutting and pasting relevant text into new documents for each sub-category. A total of seven categories and eleven sub-categories were created. (5) Negative cases, or passages that differed from the majority of the data, were dealt with by searching for similar cases. Deviations were considered anomalies if no related cases were found. If related cases were identified, additional sub-categories were created. (6) A summary was written for each category and sub-category. (7) All categories were checked for internal

homogeneity to ensure all the data within each category was appropriate. (8) Finally, the relationships between the categories were considered.

## Trustworthiness

Traditional criteria for assessing a study's rigor including internal validity, external validity, reliability, and objectivity are rooted in the positivist paradigm (Guba & Lincoln, 1989). Because of the ontological, epistemological, and methodological differences between the positivist and naturalistic paradigms, the methods of assessing rigor for positivist studies do not apply to naturalistic inquiries such as the present study (Lincoln & Guba, 1986). Instead, Lincoln and Guba proposed criteria of trustworthiness specific to naturalistic inquiry including credibility, transferability, dependability, and confirmability.

### *Credibility*

Credibility is parallel to internal validity (Lincoln & Guba, 1986) and refers to "the match between the constructed realities of respondents (or stakeholders) and those realities as represented by the evaluator" (Guba & Lincoln, 1989, p.237). Measures taken in the present study in order to ensure credibility included member checks, peer debriefing, and negative case analysis (Lincoln & Guba). Guba and Lincoln noted that member checks are the most important method for achieving credibility. Member checks enable the data, preliminary analyses, and interpretations to be verified with participants. Member checks involve "continuous, informal testing of information by soliciting reactions of respondents to the investigator's reconstruction of what he or she has been

told or otherwise found out and to the constructions offered by other respondents" (Lincoln & Guba, p.77). Mayan (2001) described verification as "the process of checking, confirming, making sure, and being certain" (p.26).

In the follow-up interviews, participant checks were conducted by reading a descriptive summary of the initial interview to each participant and asking whether the summary accurately reflected her experience. This ensured that women's stories had been heard correctly. Participants were also asked for clarification on specific comments from their initial interviews. Several comments that were made by one or a few respondents were checked with others to determine whether others had similar views or experiences. Preliminary categories were also verified during follow-up interviews by obtaining participants' feedback.

The process of member checking occurred continuously during data collection and analysis. The simultaneous data collection and analysis enabled the data and analysis to be constantly checked and for further information or clarification to be obtained in subsequent interviews (Mayan, 2001). By switching between data collection and analysis, the researcher was able to determine what the data were revealing and what remained to be explored (Mayan) through interviews with other participants and follow-up interviews.

Peer debriefing and negative case analysis were also strategies used to ensure credibility of the study. Peer debriefing occurred through discussions of the research findings and preliminary analyses between the researcher and her supervisors. This enabled the findings to be reviewed and for objective feedback to be obtained. Negative case analysis involved searching the interview data for instances that did not fit the

preliminary categories, themes, and hypotheses (Lincoln & Guba, 1986). Categories and themes were developed and refined until most cases were accounted for (Guba & Lincoln, 1989). Negative case analysis results in "confidence that the evaluator has tried and rejected all rival hypotheses save the appropriate one" (Guba & Lincoln, p.238).

### *Transferability*

Transferability is parallel to external validity or generalizability and can be attained through thick description to enable readers to assess whether the results may be applied in other contexts (Lincoln & Guba, 1986). Transferability is relative and depends on how closely relevant conditions overlap or match (Guba & Lincoln, 1989), or the degree of congruence between the research setting and the setting to which the results may be applied (Lincoln & Guba, 1985). The provision of thick description helps readers to determine how similar the conditions and contexts are to other settings. Thick description includes the place, context, and culture of the setting (Guba & Lincoln), which were all described in the present study.

Although the specific name and location of the community were not disclosed to prevent stigmatization, the study took place in a rural, Southern Alberta First Nations community. Details about the community will be presented in the Results and Discussion section. The results of the study are only relevant for Aboriginal women living in similar settings and may not be relevant for urban Aboriginal women for instance. Because of the differences in culture, traditions, and beliefs among different Aboriginal populations, it is incumbent upon the reader to assess applicability of the results to communities other than Southern prairie Aboriginal communities.

### *Dependability and Confirmability*

Dependability is parallel to reliability and is concerned with the "stability of the data over time" (Guba & Lincoln, 1989, p.242). Confirmability is parallel to objectivity (Lincoln & Guba, 1986) and ensures that the findings are based on the contexts and participants and have not resulted from the researcher's imagination (Guba & Lincoln). Audit trails were kept relating to the process and results in order to achieve dependability and confirmability, respectively (Lincoln & Guba). Decisions and insights throughout the data collection, analysis, and interpretation processes were documented (Mayan, 2001). For instance, decisions about the selection of participants, reasons for modifications to interview questions, and progress of the analysis and interpretation of the data were recorded. Such an audit trail enables the researcher to explain how the results were obtained (Morse & Richards, 2002) and is important as a method of ensuring dependability and confirmability.

## Ethical Considerations

### *Ethical Review*

Prior to proceeding with the study, it was reviewed and approved by the Board of Directors for the First Nations community's Department of Health (March 11, 2003). As well, prior to commencing the study, ethics approval was obtained from the University of Alberta's Health Research Ethics Board (Panel B) on June 6, 2003 (Appendix C).

*Informed Consent*

In order to prevent the potential for women to feel coerced into participating in the research study, the researcher was not involved in obtaining initial consent. Rather, the nurses at the prenatal clinic recruited the participants. They explained the study to potential participants, provided them with an information letter, and obtained written, informed consent from those interested in participating. The consent was to have the woman's chart and her infant's chart reviewed and to possibly be contacted by the researcher and invited for an interview. The information letter and consent form are included in Appendix D and E, respectively. The signed consent forms were placed in the women's clinic charts and the nurses kept a confidential list of women who had provided consent. When the charts were reviewed by the researcher, copies of the consent forms were made for research records.

Informed consent was also obtained for the interviews. Prior to the initial interview session, participants were provided with an information letter which the researcher reviewed with them. It was emphasized to participants that their participation was voluntary and would not affect their care at the clinic in any way. It was also made clear that they could end the interview session at anytime. After reviewing the letter, written consent was obtained. The information letter and consent form are included in Appendix F and G, respectively.

Although the prenatal staff members who work at the clinic were not formally interviewed, they provided important background information about prenatal care through informal discussions. Prior to discussing prenatal care with the staff, informed consent was obtained. The researcher explained the study to the staff and they were

provided with an information letter. Written, informed consent was then obtained. The consent form and information letter are included in Appendix G and H, respectively.

### *Confidentiality*

While obtaining informed consent, participants were assured that they would not be identified. The interview tapes and transcripts and the data collected from chart reviews were kept in a secure location and only the researcher and her thesis committee had access to them.

### *Anonymity*

Anonymity was maintained by not attaching participants' names to the transcripts or information obtained from chart reviews. Rather, codes were used to identify participants and their transcripts for the purpose of follow-up interviews. The list of participant names and their corresponding codes was kept in a secure location. Thus, only the researcher knew the identity of the participants. As well, all identifying information such as names of husbands, children, and friends were removed from the transcripts. For the purposes of this report, pseudonyms were assigned to each woman. Anonymity was also achieved by not including any excerpts or information in this report that might reveal which participant it is associated with. It was unavoidable that the staff at the prenatal clinic who recruited participants knew which women were participating in the study. However, they were not aware of what individual women reported during the interviews. Data or results were not discussed with the prenatal clinic staff. They received only the information provided in the composite report.

### *Risks and Benefits*

The topic of weight had the potential to elicit negative feelings associated with body image or self-esteem. The interviewer was attentive for any signs of unease on the part of the women, but none were evident. The information letter included a phone number for a phone service which provides counselling support and/or refers individuals to other services as required. This phone number was pointed out to participants when informed consent was obtained. None of the women needed to phone the service to the researcher's knowledge. Because the researcher was from a different cultural group than the participants, special care was taken to ensure cultural sensitivity in all phases of the research process including report writing.

The immediate benefit for women who participated in the study was the provision of a gift certificate to a local grocery store for each interview. The benefits for women who attend the prenatal clinic may be services that better meet their needs to support them in maintaining appropriate weight gain. Ultimately, this may lead to improved health for both mother and infant. The prenatal clinic will be able to tailor services to help women achieve healthy weight gain with the insights and recommendations provided by the research. For instance, the identification of features that distinguish women who gained appropriate weight from those who gained excessive weight in pregnancy and better understanding of women's views regarding the facilitators and barriers to achieving healthy weight gain will be valuable in order to adjust services. In addition to informing prenatal practice in the Southern Alberta Aboriginal community, the research has the potential to aid health care professionals who work with Aboriginal

women across Canada to tailor community support and prenatal care to the specific needs of Aboriginal women.

## Study Limitations

This study's limitations should be considered. First, the researcher's skill developed throughout the course of the research project as this was her first experience with semi-structured interviews. She became more skilled at following leads and eliciting in-depth perspectives over time. Follow-up interviews provided an opportunity to gain further information on areas that were not adequately explored during the initial interviews.

Second, most of the interviews took place in women's homes and others were often present. In some cases the interviews were frequently interrupted. For instance, children and infants often interrupted the interviews causing the participants to lose their focus and train of thought. The researcher used probes to encourage the participants to continue their discussion from before the interruption but women sometimes could not remember what they were going to say. Other adults were present during interviews with two women. The researcher suggested that the interview take place in a separate room; however, the women were not concerned with the presence of other adults. The presence of others did not seem to alter women's responses or cause them to be less open; however, this cannot be known for certain.

Third, the women's prepregnancy weights were questionable because they were not measured. Rather, they were self-reported weights and were subject to recall error. Thus, women's weight gain and prepregnancy BMI categories may not have been

accurate and women may have been misclassified into the normal or excessive weight gain group. Fourth, women's reports of the information and feedback they received from health professionals was not compared to actual information and feedback provided. It would have been useful to determine whether women's perceptions differed from the actual feedback and information given by health professionals.

Finally, the study was limited because eating and physical activity behaviours were not accurately determined. For instance, a food frequency questionnaire or 24 hour recall was not used to measure women's actual food intakes. As well, a detailed physical activity log was not used to assess women's actual physical activity. Instead, women subjectively reported their eating and physical activity behaviours. More detail about women's actual eating and physical activity could have contributed more accurate insight into differences between the groups and could have verified women's accounts of their diet and physical activity.

The results of this study may not be generalizable to all Aboriginal women. Rather the results are generalizable to Aboriginal women living in similar rural Aboriginal communities. The results should be interpreted in relation to other Aboriginal populations with awareness of the unique cultures, beliefs, and traditions of different Aboriginal communities.

# CHAPTER 4:

# RESULTS AND DISCUSSION

## Background on the First Nations Community

The Aboriginal community involved in the study is located in Southern Alberta and is home to approximately 7,300 First Nations people, with an additional 2,000 First Nations people living outside the community (Department of Indian Affairs and Northern Development, 2003). The community is rural and covers a large land area. There is a central town site which is located approximately 30 km from nearby towns. Geographically, the community is very spread out, and there are large distances between homes except for those located in the central town site. Many individuals do not have access to vehicles and many homes do not have telephones.

In 2001, the median household income for families living in the First Nations community was about 2.8 times lower than that for Alberta families in general (Statistics Canada, 2003b; Statistics Canada, 2003c). The unemployment rate was 31.2% in the community (Statistics Canada, 2003b) compared to 5.2% for Alberta in general in 2001 (Statistics Canada, 2003c). The unemployment rate for Aboriginal women in the community was 25.7% (Statistics Canada, 2003b). In 2001, about 14.6% of families in the community were headed by a single mother (Statistics Canada, 2003b) compared to 11.5% of families in Alberta (Statistics Canada, 2003c). In terms of educational attainment, the highest levels of schooling achieved for individuals 25 years of age and older were as follows: 37.3% had less than a high school diploma; 5.8% had a high school diploma; 19.8% had some postsecondary education; 32.0% had a trades, college or university degree or certificate (below bachelor's degree); and 4.7% had a university

degree at the bachelor's level or higher (Statistics Canada, 2003b). For comparison, according to the 2001 Census, 30.6% of Albertans (age 15 years and older) had less than a high school diploma, 24.1% had a high school diploma and/or some post secondary education, and 17.1% had a university degree or diploma (Statistics Canada, 2003c)

Little information is available on the health status of First Nations individuals living in the community. Approximately 23% of adults reported having one or more long-term health conditions diagnosed by a physician (Statistics Canada, 2003a); however, details on obesity and chronic diseases such as diabetes were not available. In a presentation to staff at the community's health clinic, a local physician spoke about the issues he/she viewed as important in daily practice. These included domestic violence, an increasing prevalence of breast cancer, obesity, and type 2 diabetes. He/She also mentioned that women gain a lot of weight in pregnancy which contributes to obesity.

The community has a medical clinic as well as a community health unit which offers a prenatal program among other services. Counselling and social services as well as a food bank are available in the town site. Other amenities include one small grocery store with a limited selection of nutritious foods and at least three small convenience stores stocked with foods typical of a small gas station store. The convenience stores offer mainly low nutritional foods such as chips, pop, slurpees, chocolate, candies, and packaged baked goods. A small restaurant beside the grocery store offers take out food including mainly fried foods. The community's long-term care facility offers take out food and has healthier choices, although not all foods available are healthy options.

In terms of recreational facilities, there are playing fields and tracks outside the local schools and there is a small hockey arena in the town site. In the town site, the

roads are paved and there are a few sidewalks; however, most roads in the community are dirt roads with no walking paths. Stray dogs are prevalent in the community and dog bites are an important public health concern. Standard recreation facilities such as a swimming pool, gym, and recreation centre are available in surrounding towns, 30 to 45 km from the town site. These nearby towns also have fast food restaurants and larger grocery stores. Many women living in the town site do not own or have access to a vehicle and thus have limited access to nearby towns and their amenities.

## Background and Demographics of the Participants

A total of 13 women participated in the study, 6 with normal prenatal weight gain and 7 with excessive prenatal weight gain. Background characteristics of women with normal and excessive weight gain are provided in Table 1. Women who gained excessive weight in pregnancy were slightly younger on average (24 years) compared to those with normal weight gain (26 years). Women with excessive gain also had a slightly higher average prepregnancy BMI (32.4) compared to women with normal weight gain (30.2). This finding is similar to other studies which have found that women who gain excessive weight have a higher prepregnancy BMI than those who gain normal weight (Caulfield et al., 1996; Olson & Strawderman, 2003; Strychar et al., 2000).

In terms of prepregnancy BMI classification categories (Health Canada 2002), more women with excessive weight gain were considered obese ($n = 5$) compared to those with normal gain ($n = 3$). Equal numbers of women in each group were considered overweight, and two women with normal weight gain compared to one woman with excessive weight gain were considered normal weight before pregnancy. The average

prenatal weight gain was 11.2 kg and 21.8 kg for women with normal and excessive weight gain, respectively; thus, there was a 10.6 kg difference in the average weight gain between the groups. It should be noted that actual weight gain was likely higher than that reported because the last pregnancy weight used to calculate prenatal weight gain was not at delivery but rather was the last recorded weight, within 1 month of delivery.

A major difference existed between the groups in the number of women who had been pregnant previously. Only one woman with excessive weight gain had been pregnant in the past whereas all six of the women with normal weight gain had previous pregnancies. This is similar to Caulfield et al.'s (1996) study which found that women who over-gained were more likely to be pregnant for the first time. In the present study, all women who had been pregnant previously and none of the women who had not been pregnant previously had children living with them. Another difference between the groups was the number of women who were single. Four of the women with excessive weight gain were single compared to only one woman with normal weight gain. The remaining five women with normal gain and three with excessive gain were married or in common-law relationships.

More women with excessive weight gain lived in the First Nations community for the duration of their pregnancy ($n = 6$) compared to those with normal weight gain ($n = 3$). Women who did not live in the First Nations community lived in surrounding rural communities. There were no obvious differences in education attainment or the number of women with a family income below the low-income cut-offs (National Council of Welfare, 2002). There was only a minimal difference in the number of women who attended prenatal classes and received counselling from a dietitian.

Table 1

*Characteristics of Women with Normal and Excessive Weight Gain*

| Characteristic | Normal weight gain ($n = 6$) | Excessive weight gain ($n = 7$) |
|---|---|---|
| Average age (years) | 26 (range 19-36) | 24 (range 19-32) |
| Average prepregnancy BMI ($kg/m^2$) | 30.2 (range 20-40.2) | 32.4 (range 22-38.7) |
| Prepregnancy BMI classifications[a] | | |
| Normal (BMI 18.5 – 24.9) | 2 | 1 |
| Overweight (BMI 25.0 – 29.9) | 1 | 1 |
| Obese | | |
| Class I (BMI 30.0 – 34.9) | 1 | 3 |
| Class II (BMI 35.0 – 39.9) | 1 | 2 |
| Class III (BMI ≥ 40.0) | 1 | 0 |
| Average weight gain (kg) | 11.2 (range 7.3-14.6) | 21.8 (range 13.2-29.1) |
| Family income below low-income cut-off[b] | 3 | 3 |
| Education | | |
| Less than grade 10 | 1 | 1 |
| Grade 10-12 | 3 | 4 |
| College or University | 2 | 2 |
| Live in the Aboriginal community | 3[c] | 6 |

| Characteristic | Normal weight gain | Excessive weight gain |
|---|---|---|
| Marital Status | | |
| Single | 1 | 4 |
| Married or common-law | 5 | 3 |
| First pregnancy | 1 | 6 |
| Attended prenatal classes | 5 | 6 |
| Received dietitian counselling | 2 | 3 |

[a]Health Canada (2002) BMI classifications.

[b]National Council of Welfare (2002) low-income cut-offs.

[c]In addition, one woman lived both in the Aboriginal community and outside the community during her pregnancy.

## Understanding Prenatal Weight Gain

A number of themes became apparent through analysis of the interview data. The themes will be presented within an organizing framework including of the following categories: 1) personal factors; 2) the social environment; and 3) the economic and physical environment. Themes relating to personal factors, the social environment, and the economic and physical environment all had important implications for health behaviours (eating and physical activity) and prenatal weight gain. This chapter presents the themes within each category and Chapter 5 explores the interconnections between them. Similarities and differences between the women who gained normal and excessive weight in pregnancy will be discussed throughout. The abbreviations 'N' and 'E' are used to identify women with normal and excessive weight gain respectively. Quotes are

verbatim except most repeated words and words such as "um" and "ah" were removed for readability.

## Personal Factors

It was evident from the interviews that personal factors are central to prenatal weight gain. The personal factors that arose as being important include beliefs, body image, individual characteristics, personal desire and motivation, and stress. Although discussed individually, these themes are integrally related.

### *Beliefs*

This section reveals women's beliefs about weight gain, eating, and physical activity. It can be implied that women's beliefs about these subjects affected their health behaviours and prenatal weight gain. Women's perspectives about the factors that influence weight gain, eating, and physical activity are also presented later in this section.

#### *Beliefs about Weight Gain*

It is important to understand women's beliefs about weight gain during pregnancy as their beliefs undoubtedly influenced their actual weight gain.

*Beliefs about healthy weight gain.* There were differences in women's beliefs or knowledge of appropriate prenatal weight gain between women who gained normal and excessive weight. Appropriate weight gain ranges are based on women's prepregnancy BMI. Women with a normal BMI should gain 25 to 35 lbs (11.5 to 16 kg) and women with a high BMI should gain 15 to 25 lbs (7-11.5 kg) (Health Canada, 2002). Weight is

discussed in pounds rather than kilograms in this section because pounds were the units used by the women in their narratives.

When asked how much weight should be gained during pregnancy, more women with normal weight gain suggested numbers within the recommended ranges. In fact, four women with normal prenatal weight gain suggested appropriate weights compared to only one woman with excessive gain. Alex (N) said, "*maybe 20 to 30 pounds*" (Alex, p.2)[1] and Fay (N) said, "*about maybe 20 pounds*" (Fay, p.2). The range of 20 to 30 lbs suggested by two women with normal weight gain slightly exceeded the upper limit of 25 lbs for their prepregnancy BMI. Of the two remaining women who had normal weight gain, one suggested weights that were below the recommended range: "*like 5 or 10 pounds*" (Carrie, p.1); and the other suggested weights higher than recommended: "*I'd say 35 to 45 pounds*" (Anna, p.2).

Of the seven women with excessive weight gain, only Debbie (E) suggested weights within the recommended range for her prepregnancy BMI: "*I'd say about 20 to 25 pounds*" (Debbie, p.1). Four women who gained excessive weight suggested weights that were higher than the recommended ranges. The highest suggested weight was 60 lbs: "*I averaged about 60 pounds about there and I thought that was pretty good*" (Kate, p.4). This is more than double the upper limit (25 lbs) for Kate (E) who had a high prepregnancy BMI. For these four women, it appeared that their beliefs about healthy weight gain which were higher than recommended influenced their actual weight gain since they all over-gained. They were perhaps not attempting to control their weight gain as much as they could have because they believed their weight gain was healthy.

[1] Page numbers are included with women's excerpts to enable the quotes to be found in women's transcripts for future review by the researcher or research committee.

Three women with excessive weight gain suggested weights that would have been appropriate if they had a normal prepregnancy BMI. This suggests that some women were informed about healthy weight gain; however, they did not have accurate information and lacked awareness that overweight and obese women need to gain a lower amount of weight than women of normal weight. Two women with excessive weight gain did not have knowledge about a healthy amount of weight to gain and could not suggest a weight range.

Most women who suggested appropriate weight gain ranges actually gained healthy weight ($n = 4$) and most women who gained excessive weight did not suggest appropriate weight gain ranges ($n = 6$). The link between accurate information about healthy weight gain and actual weight gain is consistent with the literature. Cogswell et al. (1999) and Taffel et al. (1993) found that when women were informed about a healthy weight range by their physicians, they were more likely to gain within this range. In these studies, it was likely that both accurate information about weight gain and encouragement from a physician resulted in women gaining within the appropriate ranges. Although accurate knowledge about healthy weight gain seemed to contribute to actual weight gain, as will be discussed in the *Social Environment* and *Economic and Physical Environment* sections, knowledge was not sufficient to promote healthy weight gain.

*Formulation of ideas about healthy weight gain.* Advice about prenatal weight gain from health professionals influenced women's beliefs about prenatal weight gain. However, less than a third of the women with excessive weight gain ($n = 2$) and half of the women with normal gain ($n = 3$) said they received information from health

professionals about healthy prenatal weight gain. This will be discussed in the *Social Environment* section. The women who stated they did not receive advice from health professionals, and who suggested a weight range, had formulated their own ideas about healthy weight gain.

Carrie, Alex, and Anna, who all had normal weight gain, based their suggested weight range on their experience in their previous pregnancies. For instance, Alex (N) recommended 20 to 30 lbs because this is what she gained in her previous pregnancies and she felt that this amount was good. She described her experience from previous pregnancies: "*Everything that I was actually eating was just mainly going to the baby and I wasn't actually gaining anything on top of it. It was just mostly the baby so that's why I figure that was a good weight*" (Alex, p.2).

Carrie's (N) rationale for suggesting 5 or 10 lbs was based on her negative experiences with weight gain in previous pregnancies. She gained a lot of weight in past pregnancies and had a very difficult time losing it.

> *Ever since I had my first child I got really, really fat. I weighed like almost 200 pounds and I was like only 90 or 95 pounds and I was almost 200 pounds (laughs). And I didn't like that because, that was my first child, and I didn't really like that. I looked so* ***big*** *and I didn't really like that. And then I tried to lose weight but I couldn't lose any weight for a* ***long*** *time.* (Carrie, p.3)

She thought if she gained only a few pounds she could return to her normal weight quickly. When discussing healthy weight gain, she said, "*Just a few pounds. But not that much like so you can just exercise for a few days and then go back to your normal size. . . . It would be easier to lose it and then get back to your regular size. Instead of, like a*

*couple months*" (Carrie, p. 2). An appropriate amount of weight gain for Carrie would have been 25 to 35 lbs (11.5 to 16 kg). Interestingly, only two out of these three women were able to suggest a healthy weight gain range that was within the recommended range. Thus, even women who had experience with previous pregnancies were not all appropriately informed about healthy weight gain ranges.

Most women with excessive weight gain had not been pregnant previously ($n$ = 6), and thus were not able to base their ideas about healthy weight gain on experience. Rather, Olivia, Val, and Kate, who had excessive weight gain and had not received weight gain advice from health professionals during pregnancy, based their suggested weight ranges on their experience in their current pregnancies. Thus, their ideas about healthy weight gain may not have been formulated until after they delivered. In other words, they may not have had a weight gain goal in mind throughout their pregnancies which likely contributed to their gaining excessive weight. All three of these women suggested healthy weight gain ranges that were high. Kate (E) thought 60 lbs would be a healthy amount of weight to gain because this was the amount she gained and her doctor said it was good. Kate received feedback from her doctor about weight gain after her pregnancy when she asked for it.

> *Well I was at 180 and through my whole pregnancy I only went up to 230, no 240. So I didn't like, and then that like to me that was good and like I asked the doctors how good was that and he/she said that's good so you don't get left with all this overweight kinda thing. Like the more weight you gain that's when you get left with it. So I figured it was pretty good. So I averaged about 60 pounds about there and I thought that was pretty good.* (Kate, p.4)

In summary, women who were not informed about healthy weight gain by their health professionals constructed their own ideas about healthy weight gain. Women with normal weight gain were able to base their ideas of healthy weight on previous pregnancies. However, women with excessive weight gain who did not receive advice from health professionals had not been pregnant previously and used their experience in their most recent pregnancy to formulate their ideas of healthy weight gain. Women who had experience with previous pregnancies were more likely to suggest an appropriate weight gain range than those without experience.

*Rationale for suggested weight gain.* There were various reasons that women believed the weight ranges they suggested were healthy. Differences between the groups were not evident. One woman in each group said the weight they suggested would be enough for the baby to be healthy but not so much that the mother would be overweight or have a lot of weight to lose after pregnancy. Sally (N) explained why she thought 20 to 30 pounds would be good: "*Like for the baby to be healthy and for you not to be too overweight afterwards*" (Sally, p.2). Debbie, who was the only woman with excessive weight gain to suggest an appropriate weight range, explained her rationale:

> *I don't know it's not a whole lot and it's not too little. . . . It's not a large number, it's not a small number. Like if you gain, you don't have a lot like too much weight to lose after you're done being pregnant, after you give birth. Then at least you know you're keeping your baby healthy by gaining weight.* (Debbie, p. 2)

Debbie (E) was informed about healthy weight gain in prenatal class.

Wiles (1998) reported that the unborn baby's health is an important factor in women's decisions about appropriate weight gain during pregnancy. Similar to Sally and Debbie's belief that a balance is required between eating enough to nourish the baby but not so much that women will be overweight or have a lot to lose after pregnancy, women in Wiles' study also suggested such a balance is required. In Wiles' study, women wanted to provide adequate nutrition for the baby's growth and development but did not want to gain excessive weight because they wanted to be able to return to their prepregnancy weight.

Julie (N) and Greta (E) both felt that gaining weight within their suggested ranges would prevent medical conditions including diabetes and high blood pressure. In addition to preventing medical conditions, Greta also thought it would make labour easier. She explained why she thought women should not exceed a body weight of 195 to 200 pounds: "*So you won't have like high blood pressure and won't catch diabetes and you won't find it so hard in labour*" (Greta, p.2).

*Beliefs about the implications of excessive weight gain.* Several women ($n = 3$ with normal gain and 2 with excessive gain) mentioned concerns about gaining too much weight, or reasons not to gain excessive weight during pregnancy. Interestingly, only two of the seven women who gained excessive weight discussed such concerns. In other words, the majority of women with excessive weight gain did not seem concerned, or perhaps were not informed, about the potential negative implications of excessive weight gain.

Women had various reasons for believing that gaining excessive weight would be problematic. There were no obvious differences between the groups. For instance, Julie

(N) felt she was already overweight and did not want to gain too much more because she thought it would be harder to lose: "*For me I didn't want to be over 300 pounds (laughs). I think it's just the more you put on the harder it is to lose"* (Julie, p. 2). Carrie (N) also did not want to gain too much weight because it would be hard to lose. Anna (N) thought that getting too big would not be healthy and might make labour more difficult. She also believed women might have more stress if they get too big: "*I think it's not too healthy to get that big, it's not like women they, during labour they seem to have a hard time and they have big babies. They probably get stressed out like that too cause you know you're so heavy and you can't, probably can't do too much*" (Anna, p.9).

Greta (E) believed that too much weight could result in her baby getting diabetes: "*If you gain too much and all of sudden all those problems it could affect the baby having diabetes*" (Greta, p.9). Kate (E) thought that the more weight women gain, the smaller their baby will be.

> *I think it's [weight gain] good but I don't think it's good because like I seen a lot of women who are really big and then when they have their baby, their baby's kinda tiny hey, like it's small. . . . I figured well the more bigger you get the more smaller your baby is. Cause I've seen like a lot of ladies who are* ***really*** *big hey and then they have their baby and they're just tiny.* (Kate, p.3)

Kate's comment is opposite to the literature that has found a positive, linear association between weight gain and birth weight (Edwards et al., 1996). The risk of delivering a high birth weight infant becomes higher with increasing weight gain (Caulfield et al., 1998; Cogswell et al., 1995).

Finally, Olivia (E) was concerned that gaining too much weight would affect her ability to care for her baby: "*I was thinking if I were to get too, like I just thought you know if I were to get too big it might affect like you know the care for her, taking care of my baby like I might be a little bit too lazy*" (Olivia, p.7).

*Beliefs about personal weight gain.* In addition to understanding women's beliefs about appropriate and excessive weight gain, understanding their beliefs about their personal weight gain is also important. All of the women who gained normal weight believed that their weight gain was healthy. Of the women who gained excessive weight, four believed their weight gain was healthy and three thought their weight gain was too high. It is not surprising that four women with excessive weight gain believed their weight gain was healthy given that all four of them had ideas of appropriate weight gain that were higher than recommended.

The reasons women believed their weight gain was healthy were variable. For women with normal weight gain, four felt their weight gain was healthy because they followed a healthy diet and/or got exercise during their pregnancy. *"I really watched everything I ate cause of the diabetes. . . . I really worked on it. I exercised, I would go for walks everyday on a daily basis"* (Alex, p.3). *"Because I watched what I ate and I didn't really, oh I didn't really eat too much like junk food. And I was like more active because I was pregnant through summer*" (Sally, p. 2).

Other women with normal weight gain had variable reasons for believing their weight gain was healthy. Carrie (N) explained why she felt she gained a healthy amount of weight: "*I feel comfortable because I'm kind of used to being big*" (Carrie, p.3). Fay (N) felt she gained healthy weight but did not explain why she felt this way. However,

she mentioned feedback she received from her physician which likely influenced her belief that she gained healthy weight:

> *The doctor said that my weight gain was ok that I wasn't, I was just gaining enough weight because I was already overweight, you know they say there's only so much weight you should gain and then that I was you know just that it was ok. It wasn't like I was overweight or anything like that with her. Like I didn't gain more than I should've.* (Fay, p.12)

Women with excessive weight gain also had various reasons for believing their weight gain was healthy. Olivia (E) and Val (E) felt their weight gain was good because they gained mainly in their stomachs. "*I mostly noticed that I was getting larger mostly around my tummy area not necessarily around like my legs and arms*" (Olivia, p.4). Olivia also thought her weight gain was normal because she was "*gaining at a steady pace*" and was "*able to lose it like right away*" (Olivia, p.4). Val also thought her weight gain was good because she did not get as big as her sister.

Kate (E) thought her weight gain was good because her baby was healthy: "*It was enough for me and my baby cause my baby was really healthy. Like I had no problems having him. Everything was good*" (Kate, p. 4). Finally, Ruth (E) believed her weight gain was good because it was within the recommended range: "*Well they [doctor and health nurses] said what 25 to 30 pounds and I gained 30 so I don't know any bit of weigh that I gained depresses me but I guess I was told that was not bad for weight gain*" (Ruth, p.2).

The reasons Sara, Debbie, and Greta felt their weight gain was excessive were also variable. When asked if she thought her weight gain was healthy, Sara (E) said, "*I*

*don't think so. Cause when I was pregnant I would always eat a lot like junk food*" (Sara, p. 4). When Debbie (E) was asked the same question, she said, "*No. (laughs) I went way over the limit. . . . The doctors never told me that it wasn't healthy, they never told me that it was dangerous or anything but just from in the prenatal classes where they tell you this is a healthy amount*" (Debbie, p.3). Greta (E) thought she "*went over*" (Greta, p.3) with her weight gain because she developed high blood pressure.

In summary, there were various reasons that women believed their weight gain was normal or excessive. It is interesting that several women with normal weight gain ($n$ = 4) and none with excessive weight gain mentioned being active and eating healthy as the reason they believed their weight gain was healthy. It is noteworthy that over half of the women who gained excessive weight in pregnancy ($n$ = 4) believed their weight gain was healthy. Beliefs about personal weight gain were integrally linked to women's ideas about healthy weight gain as well as the feedback they received from others, as will be discussed in the *Social Environment* section. It can be presumed that women's beliefs that their weight gain was healthy influenced their personal desire and motivation to take action to control it. Why would these women take action to lower their weight gain when they believed it was healthy?

*Beliefs about control over weight gain.* Women's beliefs about whether or not they could control their weight gain likely influenced their efforts to do so. For instance, Wiles (1998) suggested that women's beliefs about the extent to which their weight gain is controllable are likely to influence their diet. The women in the present study had different views about whether they could control their weight gain. Some women felt weight gain was not controllable, others believed it was controllable, and some had mixed

opinions. There were no obvious differences between women who gained normal or excessive weight gain in terms of their beliefs about whether weight gain is controllable. Wiles also found variable beliefs among women about the extent to which prenatal weight gain is controllable.

Two women with excessive weight gain and one with normal gain felt that weight gain was not controllable, at least to a certain extent. For instance, when asked what she thought about weight gain in pregnancy, Alex (N) said: "*Well I just, I didn't really think too much about it because it's inevitable, it's gonna happen you can't really do anything about it. So I didn't really linger on it*" (Alex, p.2). She also questioned whether or not women can control their weight gain because of her sister's experience:

> *My sister. . . she found out she was pregnant and she worked out even more and she just gained massive weight. . . . she gained a lot of weight and she walked and worked out more than I did. So it's hard to say, I don't know if you can have control of it. Cause I think she shouldn't've gained as much as she did by the way she was working out. Cause she went for walks everyday without fail. And she gained quite a bit of weight. . . . So it's kinda hard to say that you can control it when you don't know what's really happening with your body.* (Alex, p.13)

Val (E) did not think there was anything that could help women to gain a healthy amount of weight: "*I think it's just how the baby's growing too, how big it's gonna be. . . . You can't really tell how much you're gonna weigh. You have to go with it how big you're gonna be*" (Val, p.10). Similar to these women's beliefs that weight gain is not under their control, Wiles (1998) found that some women lacked confidence in their ability to control prenatal weight gain and felt that high weight gain was inevitable.

In contrast, three women with excessive weight gain and two women with normal gain believed that prenatal weight gain was controllable. All five of these women thought weight gain could be controlled through diet and three also mentioned physical activity ($n = 2$ with excessive gain, 1 with normal gain). For instance Olivia (E) said, "*Well healthy like weight gain, like you can probably control that like watching what you eat and what kind of activities you do*" (Olivia, p.14). Kate (E) explained how she thought women could control their weight gain:

> *Like you can control your weight, there's just different ways of doing it. You know, like everybody just does it different, nobody does it the same. . . . Like I've seen other women that have had kids, like children, like maybe just one hey and they got pretty big hey, but. It's just probably just like a difference in what you eat like, just basically what you eat like it could be different. . . . Just by watching what they eat and maybe walking. Just doing things instead of just like sleeping.* (Kate, p.19)

Similarly, Wiles (1998) found that women who believed they could control their weight gain felt this could be achieved by controlling their diet. Physical activity was not mentioned in Wiles' study as a means of controlling weight gain.

Two women in each group had mixed opinions about whether weight gain was controllable, or felt that weight gain was somewhat controllable. For instance, Carrie (N) felt that there is not anything that can be done about weight gain and women just have to take it. However, she also discussed how weight gain could be slowed by eating less food:

*Like you're getting big and you can't do anything about it, it's the baby growing. . . . All I can say is that at first you have to kinda like take it because you're growing, your baby and. It's kind of hard for you to but you have to just think about your baby first and you have to try to slow down but sometimes you just like you try to eat less food than. Eat the same food you always eat instead of eating more. Like just try to keep your plate the same. Just to let the baby grow like you don't have to eat a huge plate.* (Carrie, pp.10-11)

Ruth (E) felt that there was no way to gain less weight because of physiological body changes, but she also mentioned diet and exercise. "*I don't see how you can gain less. Cause it's hard. Your body's going through different changes. . . . I don't think there's any way as long as they watch what they eat, exercise regularly*" (Ruth, p.5). Julie (N) believed that weight gain depends on individuals' genetics and metabolism, but also depends on whether they are willing to get exercise and watch what they eat.

*I think a lot of it is genetics and the way the body is. Cause for instance, as for myself, I have to work out almost 24 hours a day, 7 days a week to lose and if I miss a day it's like I gain that plus more just like overnight, you know. It's really frustrating. So I don't think it's really, depends on the individual. . . . Just their metabolism, how much they're willing to do to watch their weight gain. Like if they're willing to work, go for walks everyday and watch what they eat and stuff like that. Whereas if they don't feel like, you know some don't really care and they just eat whatever they want and not really care about exercising. Or making a conscious effort about that.* (Julie, p.12)

Similar to these women's feelings, some of the women in Wiles' (1998) study felt that some weight gain is inevitable but they also knew they needed to keep their weight gain to a minimum by controlling their diet.

Overall, women had different beliefs about whether they could control their weight gain. Slightly more women believed weight gain could be controlled. Women's beliefs about the extent to which they could control their weight gain clearly would have influenced their efforts to do so. For instance, women who believed weight gain was not controllable would not have been as motivated to make changes to their behaviours to try and control their weight gain.

*Summary.* In summary, there were similarities and differences between women who gained normal and excessive weight in terms of their beliefs about weight gain. More women with normal weight gain suggested a healthy weight range that was within the recommended ranges for their prepregnancy BMI. Only one woman with excessive weight gain was able to do so. Over half of the women with excessive weight gain ($n$ = 4) believed that their personal weight gain was normal when it was in fact high. There were various opinions about whether or not weight gain was under women's control; however, there were no differences between the groups.

So far, women's beliefs about appropriate weight gain, about their personal weight gain, and about whether weight gain is controllable have been discussed. The next section explores women's beliefs about the influences on weight gain.

*Beliefs about the Influences on Weight Gain*

Eating and physical activity were the factors women most commonly associated with weight gain in pregnancy. Two women with excessive weight gain and one with normal gain mentioned eating and physical activity as components of a woman's lifestyle or way of life. Olivia (E) said, "*If they have a healthier lifestyle I guess they'll be able to maintain a healthy weight you know during pregnancy. . . . like well just their diet and physical activity*" (Olivia, p.3). Ruth (E) explained why she thought weight gain during pregnancy is different for everyone: "*Their way of life. . . . like what they're active, if they're used to eating right or you know, just different ways of upbringing, different ways of living*" (Ruth, p.2).

Women's beliefs about the influences on weight gain impacted the means by which some women tried to control their weight gain. However, as will be discussed in *Personal Desire and Motivation*, controlling weight gain was not a common motivator to eat healthy or be active. The following sections detail women's beliefs about the individual influences of eating and physical activity on weight gain. Women's beliefs about other influences on weight gain are also discussed.

*Eating influences weight gain.* All women were aware of a connection between eating and weight gain. For instance, Sally (N) explained why she felt she gained healthy weight: "*Because I watched what I ate and I didn't really, oh I didn't really eat too much like junk food*" (Sally, p.2). Anna (N) believed that the reason some women gain more than others is because "*some people eat healthier than others*" (Anna, p. 2). Specifically, women mentioned the quantity of food eaten, 'proper eating,' junk food consumption,

and specific food choices as contributors to weight gain. There were no differences in beliefs about the influence of eating on weight gain between the groups.

Two women in each group mentioned that the amount of food consumed contributes to weight gain. For instance, Carrie (N) felt that overeating results in weight gain and being left with extra weight after pregnancy.

> *Just at the end it's not good because then you're like eat more stuff and that, because you overeat and you're not eating the amount you're supposed to be eating. You overeat. I think that's why you gain weight after you're pregnant, because you eat so much that, in your pregnancy, you gain. You eat more than you eat when you first get pregnant. That's one of the reasons why you get stuck with all this extra.* (Carrie, p.5)

Three women with excessive weight gain and two with normal gain felt that following a "proper" or healthy diet contributes to healthy weight gain. Julie (N) described what she thought helps women to gain healthy weight: "*I think a proper diet, not eating for two, exercising. Just basically taking care of themselves, getting enough rest. You know a balance of rest and exercise and good nutrition*" (Julie, p.8). Val (E) explained why she thought she gained healthy weight:

> *Because I had to eat right. (laughs) I had to watch what I eat and really. . . . I really ate good for awhile. . . . I felt good eating like the right foods and everything like that. I wouldn't feel right if it was the other way around, junk food, pop and stuff like that. But I feel like I was you know, was eating well.* (Val, p.2)

Olivia and Debbie, who both gained excessive weight, mentioned that eating according to Canada's Food Guide would help women gain a healthy amount of weight. "*If they go by that health food guide you know for pregnant women. That would probably help*" (Olivia, p. 11). "*Just eating right. Eating from the food guide and like not overdoing it when you're eating*" (Debbie, p.7). As well, Julie (N) said she tried to follow the food guide and thought this contributed to her healthy weight gain:

> *I think I made more of a conscious effort on my part to eat, like I'd bring a lunch, I'd pack a lunch so therefore it wasn't as, like I had to run over and get a cheeseburger and fries. Or I brought leftovers from supper the night before. I always tried to maintain, tried to follow the Canada Food Guide, with so many servings of fruit and vegetables, and dairy.* (Julie, p.12)

Three women in each group linked the consumption of junk food to weight gain. Two women with normal weight gain and one with excessive gain discussed how the consumption of junk food contributes to higher weight gain. For instance, Julie (N) believed that one of the reasons she gained a lot of weight in her previous pregnancy was because she ate a lot of junk food.

> *My first pregnancy I ate whatever I wanted and a lot of junk food. And then I wasn't as active. And then when I stayed with my sister, her husband fed me constantly and, well like I said, I wasn't exercising or anything as much as I did on this last one. So I think that's why I gained weight, all that weight.* (Julie, p.10)

Anna (N) discussed how pop can promote higher weight gain:

*One of the things I think not to have during pregnancy is pop. That's just something, a major thing not to have. Because I was, me and my cousin were pregnant at the same time and she was, had a lot and she gained a lot of weight, a lot like she was way bigger than I was. That's something I didn't take was pop. She seemed to gain a lot more weight although she exercised a lot. That was something that she took a lot of. She gained more weight than I did.* (Anna, p.3)

Two women in each group discussed how avoiding or limiting junk food could contribute to lower or normal weight gain. For instance, Sally (N) felt that she gained a lower amount in this pregnancy compared to her previous pregnancy because she reduced her consumption of junk food: "*I basically didn't really watch what I ate with him [first pregnancy]. I ate more junk food and but with this one I watched. . . . Like I limited myself with junk food"* (Sally, p.7). Greta (E) felt that eating fewer sweets, pop and other junk food would help women to gain less weight:

*If you don't eat like junk food, sugar, pop. If you did stay away from like sweet stuff. Stay on your diet, watch what you're eating. That way you don't gain so fast. Cause if you do always eat like that then you really gain.* (Greta, p.10)

Kate (E) and Greta (E) both mentioned that reducing or eliminating pop would help lower weight gain. And Julie (N) thought that eating less fast food would contribute to normal weight gain.

Other foods that were associated with weight gain included vegetables, fruit, water, and fattening foods. Two women with excessive gain and one with normal gain mentioned that vegetables, or fruit and vegetables would contribute to lower weight gain. One woman with excessive gain thought that drinking water would lead to lower weight

gain. And one woman with normal gain said that not eating fattening food would help achieve normal weight gain.

It can be concluded that all women were aware of the connection between eating and weight gain in pregnancy. Similar to women's beliefs about the association between eating and weight gain, studies have found that the quantity of food consumed, as well as macronutrients including energy, protein, and fat have all been associated with weight gain in pregnancy (Lagiou et al., 2004; Olson & Strawderman, 2003). Junk food, which was mentioned as a contributor to weight gain, tends to be high in energy and fat.

*Physical activity influences weight gain.* All women identified exercise as a factor that influences weight gain during pregnancy. Six women in each group believed that physical activity promotes healthy weight gain. For instance, Olivia (E) thought the following would help women to gain healthy weight: "*Just physical activity that's not too strenuous*" (Olivia, p.11). Physical activity was also mentioned by five women with excessive gain and four with normal gain as a means of gaining a lower amount, or healthy amount of weight as opposed to gaining too much weight during pregnancy. Anna's (N) suggestion to promote lower weight gain was: "*exercise as much as you can*" (Anna, p.8). Sally (N) also thought "*being more active*" would help women gain lower weight during pregnancy. When Debbie (E) was asked what would have helped her to gain a lower amount of weight, she said: "*I think if I stayed active throughout the whole pregnancy. Cause there'd be spurts where I'd exercise then there'd be times where I wouldn't exercise for like a week or so. Then I'd get back on track with it*" (Debbie, p.11).

Three women with excessive prenatal weight gain and two with normal gain also mentioned the connection between inadequate physical activity or being sedentary and higher weight gain. For instance, Sara (E) felt her weight gain was too high because she did not get much activity: *"[I was] always sleeping and they'd say to always go for walks but I hardly went for walks. I was lazy"* (Sara, p.4). Debbie (E) thought that her weight gain would have been higher if she had not exercised during her pregnancy: "*And with the weight gain it was, if I didn't exercise I think I would've gained even more*" (Debbie, p.4). Julie (N) mentioned that although others were encouraging her to rest all the time, she felt this would cause her to gain more weight: "*But I knew if I laid around all the time I'd probably end up you know gaining lots of weight*" (Julie, p.9).

In addition to being aware about the link between eating and weight gain, all women were also aware of the association between physical activity or inactivity and weight gain. There were no obvious differences in beliefs about physical activity and weight gain among women who gained normal and excessive weight. Consistent with women's beliefs about the link between physical activity and weight gain, studies have associated physical activity during pregnancy with lower weight gain (Clapp & Little, 1995; Olson & Strawderman, 2003).

*Other influences on weight gain.* A number of other influences on weight gain were identified by the women. Three women with normal weight gain and four women with excessive gain mentioned the baby's influence on weight gain. For instance, Sara (E) thought that her weight gain was going to the baby: "*I thought that the baby was gonna be big, that's why I gained the weight. I thought the baby was gonna be big like 10 pounds*" (Sara, p.13). Val (E) believed that weight gain was dependent on the size of

the baby. When asked if there were things that would help women to gain a healthy amount of weight, she said, "*I don't think so. I think it's how the baby's growing too, how big it's gonna be*" (Val, p.10). Concurrent with women's beliefs about the influence of the fetus on prenatal weight gain, Hytten (1980) determined that the fetus accounts for about 25% of prenatal weight gain.

Two women with normal weight gain and three with excessive gain noted that fluid can contribute to weight gain. For instance, Alex (N) said "*The baby doesn't weigh that much when it actually comes out and a lot of it's water, so you shouldn't really be gaining* ***that much*** *weight*" (Alex, p.2). Julie (N) said: "*I didn't realize though that sometimes a lot of that [weight gain] was fluid*" (Julie, p.2). The literature indicates that in fact fluid retention does contribute to weight gain (IOM, 1990). In normal pregnancies, there is an expansion of extracellular fluid that accounts for about 13% of prenatal weight gain (IOM). This fluid retention is highly variable and some women retain more than others (IOM).

Slightly more women with excessive weight gain ($n = 3$) than those with normal gain ($n = 1$) believed that body size or structure contributes to weight gain in pregnancy. Olivia (E) thought that bigger women might eat more which would affect weight gain. "*It's all depending on your size. . . . It kinda seems when you're bigger you just seem to eat more*" (Olivia, p.3). Ruth (E) believed that weight gain is different for different women partly because of their body structure:

> *Like I notice some girls here in [town name] that don't gain anything, they have the baby and they're a toothpick. And then I come along and get pregnant,* ***gain*** *and don't look like a toothpick after (laughs). So I don't know I think it's just*

*different for everybody. . . . Because of their body structure and their way of life.* (Ruth, p.2)

Alex (N) believed that smaller women gain more weight than bigger women:

> *I find smaller women gain more weight than bigger women. . . . I don't know if it's because bigger women have more room and they have the space for it to actually grow. And then smaller women, they have a smaller build and I don't know if that's exactly why (laughs) but it just seems like that's the way it goes cause I've seen like my sister-in-law she gained 70 pounds to 100 when she had her kids and she's very petite.* (Alex, p.12)

The height component of body structure has been found to influence women's weight gain, with shorter women gaining less weight (Kleinman, 1990). This is opposite to Alex's belief that small women gain more weight, assuming she meant short women. The relationship between prenatal weight gain and other measures of body structure such as BMI are not conclusive (IOM, 1990). The IOM concluded that only a small portion of the variation in prenatal weight gain can be accounted for by prepregnancy BMI. However, several studies have found that women who gain excessive weight have a higher prepregnancy BMI than those who gain normal weight (Caulfield et al., 1996; Olson & Strawderman, 2003; Strychar et al., 2000)

In summary, women in both groups recognized some of the physiological influences on prenatal weight gain including the fetus and fluid retention. Their belief about the influence of body structure on weight gain was less clear in the literature.

*Summary.* It is important to note that all women were informed about the connection between weight gain and both eating and physical activity. There were no

differences between the groups in terms of beliefs about the influences of healthy eating, junk food, or the quantity of food eaten on weight gain. The majority of women in both groups believed that physical activity promotes healthy weight gain and is also a means of gaining lower weight. Women also mentioned other influences on weight gain such as the baby, fluid, and body structure.

Because of the connection between both eating and physical activity and weight gain (Clapp & Little, 1995; Lagiou et al., 2004; Olson & Strawderman, 2003), it is important to understand women's beliefs about healthy eating and physical activity. Beliefs about physical activity and appropriate eating during pregnancy impacted women's actual eating and physical activity behaviours. The following sections discuss women's beliefs about eating and physical activity.

*Beliefs about Eating*

It has been established that all women in both groups believed that eating impacts weight gain. This section reveals more detail about women's beliefs about appropriate eating for pregnancy. Women's beliefs about the following topics are discussed: healthy eating in general; junk food; eating for two; and the influence of eating on the baby's health and growth.

*Healthy eating in general.* When discussing healthy eating, women mentioned *Canada's Food Guide to Healthy Eating* (Health Canada, 1992), specific food choices, and eating breakfast. Two women from each group mentioned *Canada's Food Guide to Healthy Eating* (Health Canada) when describing healthy eating. Anna (N) said, "*Just try to eat something from each of the food groups and not too much junk*" (Anna, p.6) and

Sally (N) said, "*like fruit, vegetables, like just stuff on your food guide, your nutritional food guide whatever*" (Sally, p.5). Although two women in each group mentioned using the food guide as a component of healthy eating, only two women with normal weight gain said they personally followed the food guide: "*Pretty much the dietitians had given me some kinda meal plan that I should follow with the proteins and the carbs and stuff like that. And so I tried to stick to what they had given me. I guess it would be, what is it the Canada Food Guide? And that's what I went by*" (Alex, p.17). Both women who followed the food guide said it helped them to follow a healthy diet.

In addition to the food guide as a component of healthy eating, some women mentioned specific foods as being a part of a healthy diet. Three women with normal gain and two with excessive gain specifically mentioned fruits and vegetables as an important part of healthy eating. For instance, Sara (E) described the following as healthy eating: "*Always eat vegetables, fruit*" (Sara, p.12). Sara also mentioned drinking water as a part of a healthy diet. Other foods that the participants considered to be healthy included salads, soups, sandwiches, chicken, meat, cheese, milk, yogurt, cereals, water, bran, and juice. When Julie (N) was asked what she considered to be healthy foods, she said:

> *I ate a lot of fruit, vegetables, salads, I'd have soups, sandwiches, chicken, meat. I'd try and get a variety instead of potatoes all the time, pasta, rice, dairy products, cheese, yogurt, peanut butter cause I ate some peanut butter, peanut butter quite a bit just to try and balance out the sugar like for snacks. Stay away from pop. I didn't drink anything but juice, lots of water.* (Julie, p.8)

One woman from each group discussed the importance of having breakfast as a part of healthy eating. Ruth (E) said she felt more energized and into life when she ate breakfast:

> *I don't eat as good as I did when I was pregnant now. So I think it kinda contributes to the way you feel and the weight gain. . . . Take for an example now I find it hard to eat breakfast and you know and I don't eat breakfast till about 12 then I start feeling low and stuff. When I was pregnant I made sure I had breakfast, a snack and I felt more into life I guess you could say. (I: ok) Like more energized.* (Ruth, p.3)

For Alex (N), breakfast influenced her eating during the day because if she skipped breakfast she would be starving by midmorning and would end up eating junk food. She thought that it was from not eating breakfast that she got diabetes:

> *At first I wouldn't, I wasn't eating and I believe that's how I got the diabetes. Cause I never ate breakfast and I would be starving come 10:00 at work and then I'd turn around and eat junk food. And the junk food, it wasn't maintaining my sugars all day. I think that's what caused it. . . . Pop, slurpees, chips, chocolate bars (laughs). . . . I never realized that breakfast was so important.* (Alex, p.5)

*Junk food.* In their discussions about healthy eating, the majority of women (6 women in each group) mentioned the need to avoid junk foods. They considered junk foods to be chips, chocolate, candy, cheeseburgers with fries, fried foods, fast food, fatty foods, pop, slurpees, corn nuts, popsicles, ice cream bars, and sugar. Six women in each group felt that junk foods should be avoided or eaten only occasionally during pregnancy. Two women with excessive weight gain and one woman with normal gain thought that

eating junk food or sweets could lead to diabetes. For instance, Olivia (E) changed her eating to prevent herself from getting gestational diabetes:

> *I just lessened the salt in my diet and the sugars and I you know I kinda changed the way I cooked, instead of frying all my food I just kind of boiled or baked. . . . I cut down, like if I wanted pop I'd have diet. And I wouldn't have too much of like dessert foods too. . . . Just hearing about diabetes and you know, like becoming a diabetic after or you know during pregnancy. . . . Just to keep it in you know mind you know while I was pregnant that there's you know, there's a possibility of becoming diabetic.* (Olivia, p.7)

Greta (E) felt that eating sweets and junk food would lead to higher weight gain which in turn could result in either herself or her baby getting diabetes.

> *If you don't eat like junk food, sugar, pop. If you did stay away from like sweet stuff. Stay on your diet, watch what you're eating. That way you don't gain so fast. Cause if you do always eat like that then you really gain. This leads to like you, if you either me or the baby can be a diabetic.* (Greta, p.10)

Two women, both with excessive weight gain, mentioned compensating for junk food. Debbie (E) said that when she ate junk food, she would compensate for it by eating healthy foods. She said: "*When I do overindulge in junk food I try to compensate it with you know doing more healthy food*" (Debbie, p.7). Kate (E) felt that junk food could be consumed if women were going to get activity afterwards but not if they were just going to rest or sleep:

> *Cause there was times where I'd get like that hey and be like, you know I'd see a bag of chips and I be I want some a those hey, you know and then after awhile I'd*

*think like oh you know it's kinda good I didn't really eat those hey cause you know I'm just gonna be going home and going to sleep so what's the use you know. If you're gonna go out and walk around like afterward ya, then go ahead eat them. But if you're gonna go home and go to sleep then there's really no use to eating chips and candy and stuff like that.* (Kate, p.16)

The literature suggests that women's knowledge of general nutrition for pregnancy is suboptimal (Fowles, 2002). In the present study, the majority of women were knowledgeable about the need to avoid or limit junk foods, and a few women mentioned following *Canada's Food Guide to Healthy Eating* (Health Canada, 1992) and consuming fruits and vegetables as a part of healthy eating; however, detailed knowledge about nutrition was not examined. Thus conclusions cannot be made about the adequacy of women's nutrition knowledge. There did not appear to be any differences between the groups in terms of nutrition knowledge. However, two women with normal weight gain and none with excessive gain mentioned that they were personally following *Canada's Food Guide* (Health Canada).

There was a difference in the consumption of junk foods between women who gained normal and excessive prenatal weight. Most women with normal weight gain ($n$ = 5) consumed little junk food during pregnancy and only one appeared to consume higher amounts. For instance, Julie (N) said, "*And I'd allow myself like a bag of chips once in awhile, I didn't make it a regular habit*" (Julie, p.2). Sally (N) said, "*I watched what I ate and I didn't really, oh I didn't really eat too much like junk food*" (Sally, p.2).

In contrast, most women with excessive prenatal weight gain consumed relatively high amounts of junk food. For these women, there was a disconnection between their

beliefs about the need to avoid junk food during pregnancy and their actual consumption of junk food. Despite six women with excessive weight gain believing that junk food should be avoided during pregnancy, it appeared that five of them consumed relatively high amounts of junk food or fast food during pregnancy: *"When I was pregnant I would always eat a lot like junk food"* (Sara, p.4). *"I did a lot of eating out like at fast food restaurants"* (Debbie, p.4). *"Like pop, pop was a bad thing when I was pregnant I always drank a lot of pop"* (Kate, p.14). It should be noted that details were not obtained on women's dietary intakes, thus estimates of junk food consumption were based on women's subjective descriptions of their eating.

As previously discussed, energy and fat consumption have been associated with increased weight gain (Lagiou et al., 2004; Olson & Strawderman, 2003) and junk foods are typically high in energy and fat and thus could have contributed to women's higher weight gain. Clark and Ogden (1999) found that many pregnant women had less restraint and felt more allowed to eat "forbidden foods" during pregnancy. Despite knowing that junk food should be avoided, the women in the present study may have been less restrained in their eating because of their pregnancy state, and allowed themselves to eat junk food. However, as will be discussed in the *Social Environment* and *Economic and Physical Environment* sections, there were also social and environmental influences that contributed to junk food consumption among women with excessive weight gain.

*Eating for two.* There was a clear difference between the women who gained normal and excessive weight in terms of their beliefs about the need to eat for two. Eating for two refers to the belief that women should eat more than usual during pregnancy because they are eating for their baby in addition to themselves. Five women

with normal weight gain and one woman with excessive gain felt that there is no need to eat more than usual during pregnancy. For instance, Carrie (N) believed women should eat how they normally would: "*Eat the same food you always eat instead of eating more. Like just try to keep your plate the same*" (Carrie, p.11). She thought that when women believe their baby needs extra food they may end up overeating. She did not think the baby needed extra food to be healthy.

> *Some girls think "Oh I have to eat because of my baby." You know. That's why they overeat when they're pregnant, they think about their baby but sometimes you have to eat different. You're baby's getting enough nutrition and so are you. You don't need those extra snacks and those extra food. Once in awhile but not all the time.* (Carrie, p.9)

Ruth was the only woman with excessive weight gain who believed that women do not need to eat for two while they're pregnant:

> *I was told only so much goes to you and then the rest goes to the baby, like when you're overeating and stuff like that, so your baby grows more or whatever. I don't know how true that is but that's what I was believing and I didn't want a big baby so. . . . I don't think you have to increase your eating, healthier eating when you're pregnant. . . . I don't believe that you're eating for two when you're pregnant.* (Ruth , p.15)

In contrast to those who believed women do not need to eat for two, six women with excessive weight gain believed that women do need to eat for two, or eat more than usual during pregnancy. None of the women with normal weight gain believed they needed to eat for two. Debbie's (E) example illustrates the belief about the need to eat

for two: "*I think that most pregnant ladies do have that in their head that they're eating for two now. And like that's what I, that's what I believe, that you're eating for two*" (Debbie, p.16). She described what it means to eat for two:

> *It would just be a whole lot. Actually, it would be, if we were at a restaurant and we're ordering food, I would be ordering, let's say I'd have my meal but then I'd order an appetizer on top of that and dessert. Like I'd have the full meal deal, I'd go for it all. Cause I did have it incorporated into my head that you're eating for two. . . . It was basically that I wanna eat this, I wanna eat this much, so I'm gonna eat it cause I have another person inside of me that I have to eat for. And nobody's gonna tell me that I can only have so little. If I want more I'm gonna eat more.* (Debbie, pp.16-17)

Greta (E) thought that eating a lot was good for the baby. She felt that it did not matter if weight gain was high because it was important for the baby to be full. She said, "*Well what I experienced with my pregnancy like I would like I eat a lot and I think it's good for the baby you know to get full too and so that way you could stay full longer and just have little snacks at the end*" (Greta, p.8).

Research has not assessed women's beliefs about the quantity of food that should be consumed during pregnancy; however, studies have found that many women consume more than usual in pregnancy (Clark & Ogden, 1999; Fairburn & Welch, 1990; Olson & Strawderman, 2003). Increased food consumption during pregnancy is significantly related to the risk of gaining excessive weight and women who eat much more during pregnancy have been found to be significantly more likely to gain excessive weight compared to those who eat only a little bit more (Olson & Strawderman). It is

recommended that women consume slightly more calories than usual during pregnancy: 100 extra calories in the first trimester and 300 calories in the second and third trimesters (Health and Welfare Canada, 1990).

It can be implied that women in the present study who believed they needed to eat for two actually consumed more than usual during pregnancy, unlike those who did not believe they needed to eat for two. Although women were not specifically asked whether they acted on their beliefs about eating for two, the interview data suggests that women did act upon their beliefs. For instance, Debbie (E) described eating more because of her belief about eating for two in her previous excerpt, whereas Anna (N), who did not believe women needed to eat for two, said she "*just ate the same*" (Anna, p.6). Thus, the finding that women who believed they needed to eat for two and likely ate more than usual all gained excessive weight is consistent with the literature.

Clark and Ogden (1999) suggested that pregnancy appears to legitimize increased food intake. They found that women allowed themselves to eat more than usual because of being pregnant. As well, several studies have found a reduction in women's level of dietary restraint during pregnancy (Clark & Ogden; Olson & Strawderman, 2003; Fairburn & Welch, 1990). In the present study, it appeared that the belief about the need to eat for two legitimized increased food intake.

A few women reported episodes of overeating during pregnancy. Despite Carrie's (N) belief that she should not eat for two during pregnancy, she described episodes of overeating: *You overeat and you're not eating the amount you're supposed to be eating. You overeat. I think that's why you gain weight after you're pregnant, because you eat so much that, in your pregnancy, you gain*" (Carrie, p.5). She described

overeating as follows: "*You just eat, like keep eating and eating and you can't stop. Like every few minutes, like 10 or 20 minutes you eat something, like crackers, cookies or something*" (Carrie, p.15). The fact that Carrie reported episodes of overeating despite believing that women should not eat more than usual during pregnancy suggests she had a lack of control over episodes of overeating or suggests there were influences contributing to overeating besides beliefs, such as social influences. Social influences on eating will be explored in the *Social Environment* section.

Episodes of overeating in pregnancy were also reported by two women with excessive weight gain. Kate (E) said: "S*ometimes I'd eat, like overeat, like overeat hey and then I'd start feeling sick so I'd lay down and it kinda goes away but there's still that food that shouldn't've been eaten*" (Kate, p.8). When asked about the times she would overeat, Kate said:

> *It would happen because like I'd think I could eat all this food hey and I'd eat it, eat it, eat it, eat it. And then sometimes like I'd eat and then I'd drink and I'd eat and then I'd drink, and I'd drink water and eat some more and drink. . . . Then I'd quit eating hey and then afterwards I'd start feeling sick hey. That's how I knew I overate was because I'd feel sick afterwards.* (Kate, p.9)

Both of the women with excessive weight gain who reported episodes of overeating believed that women should eat for two. However, Kate recognized that eating for two did not mean that women should overeat: "*There's just certain points where you gotta to stop yourself from eating like you know just because you're eating for two doesn't mean you have to overeat you know*" (Kate, p.26). Thus, despite believing

that women should not overeat, Kate did overeat at times, which suggests beliefs are not sufficient to control eating.

Episodes of overeating during pregnancy were reported by Fairburn and Welch (1990). A quarter of the women in their study had episodes of substantial overeating, and many of the women who reported overeating had excessive weight gain. In the present study, two out of the three women who reported overeating had excessive weight gain.

*Eating affects the baby's health and growth.* As previously discussed, all women mentioned the impact of eating on prenatal weight gain. Additionally, several women mentioned the impact of eating on the fetus. This belief would have influenced women's eating since they wanted healthy pregnancy outcomes. As will be discussed in *personal desire and motivation*, the baby's health was a motivator for some women to follow a healthy diet. Five women with excessive prenatal weight gain and two with normal gain thought that following a healthy diet was important for the baby's health. Julie (N) felt that women should eat a healthy, balanced diet and not too much junk food because the baby needs nutrition for growth and development:

> *The baby's taking a lot. Takes a lot for you know the developing, growing, so you need to eat a good balanced, healthy diet. And eat when you are hungry. But I ate all the time but I found I was eating more nutritious food.* (Julie, p.2)

Sara (E) thought women should eat healthy foods so "*the baby would be healthy, she'll be strong*" (Sara, p.9). Debbie (E) said, "*Well for me it was more the fact that I wanted to have, to ensure that the baby's health is good. . . . Just to make sure you're gonna be having a healthy baby, eat right*" (Debbie, p.7).

Two women with normal weight gain linked eating with the baby's growth and size. Carrie (N) suggested that women who eat more will have larger babies, and those who eat less will have smaller babies. She expressed being confused by how much to eat and whether or not a large or small baby would be better because people were giving her contradicting advice.

> *Some people want you to eat because they want you to have a healthy big baby. Some people don't think you shouldn't eat that much cause they want you to have a small baby. . . . To eat or not to eat (laughs). And sometimes I kinda think I should eat lots. . . . But when I think about her like, I think my baby's going to be too small, I don't want my baby to be that small cause she won't be as strong. . . . When they're small they're like more delicate.* (Carrie, p.11)

Carrie believed that small babies are more delicate and not as strong or healthy as bigger babies. However, she also said that if women eat too much, the baby will end up being too big.

Anna (N) thought that it is unhealthy to eat too much during pregnancy and if women eat more than usual when they're pregnant they'll end up with big babies. But she also noted that it may be healthy to eat more to obtain vitamins for the baby.

> *Then I also think there is some women that do eat more. Like some women do eat more than when they weren't pregnant. . . . I kinda don't think it's healthy to eat too much because that's where you come out with big, big babies, 10 pounds, 9 pound babies. And then also then it could be healthy cause your baby does need all that vitamins.* (Anna, p.6)

Overall, more women with excessive weight gain mentioned the importance of healthy eating for the baby's health. However, more women with normal weight gain linked eating with the baby's growth.

*Summary.* There were no differences between the groups in terms of beliefs about what it means to eat a healthy diet. However, more women with excessive weight gain believed that they needed to eat for two, or eat more than usual during pregnancy. It is logical that women who believed they needed to eat more during pregnancy ended up gaining more weight. As well, there was a disconnection between women's beliefs about the need to avoid junk food during pregnancy and their actual junk food consumption for those who gained excessive weight. In other words, they believed that junk food should be avoided during pregnancy but did not avoid it themselves. Women in both groups also mentioned the impact of eating on the baby's health and growth. As will be discussed in later sections, the social, economic and physical environments mediated women's eating behaviours.

*Beliefs about Physical Activity*

Understanding women's beliefs about physical activity in pregnancy is important for understanding prenatal weight gain because of the association between physical activity and weight gain (Clapp & Little, 1995; Olson & Strawderman, 2003).

*Benefits of physical activity.* Women's beliefs about the influence of physical activity on prenatal weight gain have already been discussed. In addition, women mentioned multiple other benefits of physical activity for pregnancy including: an easier labour, reduced stress, improved emotions, increased energy, and a healthy baby. All

women felt that physical activity was good and had benefits for their pregnancy or themselves. This finding is contrary to Gray-Donald's (2000) finding that physical activity was viewed as undesirable among Cree women in James Bay, Quebec. Women's beliefs about the benefits of physical activity influenced their motivation to be active, as will be discussed in *Personal Desire and Motivation.* As well, beliefs about the benefits of physical activity influenced women's actual physical activity as will be discussed later in this section.

All women who gained normal weight ($n = 6$) and four who gained excessive weight thought that physical activity would help with labour. Besides being beneficial for weight gain, this was the most commonly reported benefit of physical activity. Julie (N) said "*I think it's good. I think it helps with labour*" (Julie, p.4). Sally (N) thought exercise was good "*so that labour will be more easier on you and faster*" (Sally, p.3). Carrie (N) described how exercise strengthens muscles that will help make labour easier:

> *I know you need to have some like just to get enough energy in your body and work out your muscles. And like resting, not too much rest you need to do things. Make sure you're doing something so you don't have a hard labour. Have to be like strengthening so you don't have like a really hard labour.* (Carrie, p.5)

Three women with normal weight gain and one with excessive gain mentioned that physical activity was a good way to relieve stress. Ruth (E) described her experience with physical activity: "*It made me feel really good and I just walked and I did Tai-bo up to my seventh month and I don't know it just was just like a stress relief. Made me feel good about myself*" (Ruth, p.3). Anna (N) also mentioned the impact of physical activity

on stress: "*It would help taking a walk to clear my mind and relieve some of that depression and stress*" (Anna, p.4).

Three women with excessive weight gain and two with normal gain mentioned that physical activity was good for their emotions or made them feel good about themselves. Ruth's (E) experience illustrates the affect on emotions:

> *I thought it helped me a lot. So I kept walking. It was good for my emotions. It was good for you know changes in the body. I thought it was really good. Kind of stabilizes you more with your emotions. . . . If I started feeling depressed or upset I'd go for a long walk. A hard long walk. And I felt refreshed afterwards. I forgot about why I was feeling down (laughs).* (Ruth, p.3)

Debbie (E) described the impact of physical activity as calming: "*It makes you feel better and how pregnant women are all emotional, it just kinda, I kinda felt it calming*" (Debbie, p.3).

Two women with normal gain and one with excessive gain thought that physical activity helped them to feel more energetic. For instance, Alex (N) said, "*It just seems to get your blood pumping and you have energy which makes you feel good*" (Alex, p.3). As well, two women with normal gain and one with excessive gain felt that physical activity would benefit their baby. For instance, Alex (N) said:

> *I really worked on the exercise and so did my other sister, and both our babies were extremely healthy when they were born. And my other sister, she had high blood pressure, she had lots of problems, she had to take it easy, and her baby when it came along he sick for the first month. So I think it's good, it builds up strength, and I think it builds up the strength in the baby.* (Alex, p.3)

Most of the women's beliefs about the benefits of physical activity during pregnancy were consistent with findings in the literature. Physical activity has been associated with an easier labour with fewer complications and improved attitude and mental state (Clapp, 2000). Studies have also found that exercise improves overall psychological wellbeing and increases body image satisfaction (Boscaglia, Skouteris, and Wertheim 2003; Goodwin et al., 2000; Koniak-Griffin, 1994).

*Concerns about physical activity.* All women believed that physical activity was beneficial to pregnancy; however, three women with excessive weight gain and two with normal gain had concerns about the safety of physical activity for their baby. For instance, Olivia (E) thought that women should only do physical activity that they're capable of doing such as walking. She thought women should not do strenuous activities that may put stress on the baby: "*Like walking, you know just what you're capable of doing while you're pregnant and what's you know healthy for you and your baby that's not too strenuous. . . . You don't want anything that's gonna strain the baby, like stress the baby*" (Olivia, p.11).

Canadian recommendations for physical activity during pregnancy suggest that women should participate in moderate aerobic and strength-conditioning exercises as long as they do not have pregnancy complications (Davies et al., 2003). Thus, moderate activity is deemed safe for uncomplicated pregnancies. It is recommended that even women who were previously inactive participate in physical activity, although their activity should be increased gradually (Davies et al.).

*Actual physical activity.* Although all women mentioned benefits of physical activity, it appeared that not all women participated in regular activity. At least two

women with excessive gain and one with normal gain were getting lower amounts of physical activity. For instance, Sara (E) said: "*They'd say to always go for walks but I hardly went for walks. I was lazy*" (Sara, p.4). The fact that these women knew of the benefits of physical activity but did not participate in regular activity suggests that there are other factors besides beliefs that influence physical activity. Factors related to the social, physical, and economic environments will be discussed in later sections.

In contrast, five women with normal gain and four with excessive gain appeared to be getting higher levels of physical activity during pregnancy. In addition, one woman with excessive gain got higher levels of physical activity but only for a period of about three months during her pregnancy because she did not start walking until about six months. Two women with normal weight gain and one with excessive gain reported walking daily during their pregnancy, thus seemed to get regular physical activity. Greta (E) said: "*I was going for walks every day*" (Greta, p.3). Alex (N) said: "*I really worked on it. I exercised, I would go for walks everyday on a daily basis and I'd, so I tried to maintain it for the diabetes and the baby*" (Alex, p.3). It should be noted that women were not asked details about the duration or frequency of physical activity, thus definitive conclusions cannot be made about their level of physical activity.

By far, the most common form of physical activity that women participated in was walking. This was the main form of exercise for most women. Five women also mentioned house cleaning as contributing to their physical activity. Other types of activities that women participated in, although not regularly, included climbing stairs, yoga at prenatal class, Tai-bo (exercise video), stretching, swimming, carrying groceries, and games at parties.

*Summary.* All women recognized the benefits of physical activity for pregnancy. There were no obvious differences between the groups in terms of their beliefs about the impact of physical activity on labour, emotions, and the baby. Slightly more women with normal weight gain believed that physical activity could relieve stress. Most women's actual level of physical activity reflected their beliefs about the benefits of physical activity. However, a few women were not very active during pregnancy despite their beliefs about the benefits of physical activity.

Overall, women's beliefs about weight gain, eating, and physical activity are important personal factors that influence weight gain. The following sections explore other personal factors that were evident in the interview data.

### *Body Image*

Body image was an important theme that emerged from the interview data. Body image is a multidimensional construct (Banfield & McCabe, 2002) and includes feelings about body size, shape, and form (Slade, 1988) among other constructs. Weight change is thought to be one influence on body image (Slade, 1994) and because pregnancy is a time when women experience rapid changes in weight and body shape, there are likely to be implications on women's body image. Two components of body image were apparent in the data including women's feelings about their bodies and feelings about weight gain. Although these are not distinct dimensions, they are discussed individually. Women expressed both negative and positive feelings about their bodies and about gaining weight.

*Negative Feelings*

Women with both normal and excessive prenatal weight gain expressed negative feelings about their bodies and about gaining weight. Four women in each group had negative feelings towards their bodies and all women with excessive gain and three with normal gain had negative feelings about gaining weight. Congruent with this finding, negative feelings about body image and gaining weight during pregnancy have previously been reported (Armstrong & Weijohn's, 1991; DiPietro et al., 2003; Fairburn & Welch, 1990; Fox & Yamaguchi, 1997; Goodwin et al., 2000). DiPietro et al. found that women who gained both normal and excessive weight during pregnancy expressed negative attitudes about weight gain but women who had higher weight gain expressed more negative attitudes towards weight gain. These findings are consistent with the current study in that women in both groups expressed negative feelings about weight gain but more women with excessive weight gain had negative feelings ($n = 7$) compared to those with normal gain ($n = 3$). It is logical that negative feelings about gaining weight would result in efforts to control weight gain. However, as will be discussed in *Personal Desire and Motivation*, controlling weight gain did not appear to be a major motivator for eating healthy and being physically active.

Pregnancy is a time when changes in body shape and gaining weight are natural and necessary, yet many women felt negatively about their bodies and about gaining weight. Thus for many women, pregnancy did not remove the desire to conform to a thin "ideal" body shape.

*Negative feelings about their bodies.* Women who had negative feelings about their bodies during pregnancy reported feeling big, fat, and ugly. When asked how she

felt about her body when she was pregnant, Carrie (N) said, "Ok. *Until later when I started getting bigger. (laughs) I felt really ugly, cause I was getting bigger. And fat. Cause I'm used to being really small. . . . I didn't really like it*" (Carrie, p.1). Val (E) said, "*I just really felt really ugly and big. I felt so big I was really, I was really humongous*" (Val, p.1).

Several of the women with negative feelings ($n$ = 2 with normal gain and 3 with excessive gain) said they felt ok about their bodies until they started showing, or started getting bigger. For instance, Debbie (E) said it was in her third trimester, when she started to show, that she did not feel good about her body: "*Well in the first and second trimester it wasn't bad. I didn't like pretty much start showing till the last trimester. So things weren't too bad. But after I got stretch marks and, ya I didn't feel good about my body at all*" (Debbie, p.1). The development of negative feelings about their bodies later in pregnancy is consistent with Fairburn et al.'s (1992) finding that women's concerns about weight increase from early to late pregnancy.

Two women in each group said their feelings about their bodies were influenced by the way their clothes fit or not being able to wear their regular clothes. For instance, Debbie (E) explained why she did not feel good about her body and how she made herself feel better by purchasing nice maternity clothes:

> *It was just before like before I got pregnant the way I used to dress, then after I had to wear like certain clothes. I couldn't dress the way that I used to. . . . I did overcome not feeling well you know very sexy or looking nice and stuff but I got used to it. Ya instead of just buying sweats and t-shirts I went out and got some nice maternity clothes to make myself feel better.* (Debbie, p.1)

Anna (N) also discussed how her clothes did not fit and she felt like nothing looked nice on her: "*While I was pregnant well I didn't feel comfortable, I felt like I was fat. I didn't like my body much. I felt like my clothes didn't fit. I felt like nothing looked nice on me like any kind of clothes I tried it didn't look nice on me*" (Anna, p.1). Feelings of unattractiveness, which were expressed by both Debbie and Anna, are consistent with a study in which 14% of the participants reported feeling unattractive because of their weight gain (DiPietro, et al., 2003).

*Negative feelings about gaining weight.* All women with excessive prenatal weight gain and three with normal gain expressed negative feelings about gaining weight in pregnancy. When asked what she thought about weight gain during pregnancy, Ruth (E) said: "*What do I think about it? (laughs) That it sucks. (laughs)*" (Ruth, p.2). Similarly, Val (E) said gaining weight "*really sucks*" (Val, p.1).

Women's negative feelings towards weight gain were demonstrated through the following: not wanting to get big or gain weight; feelings of depression; lower self-esteem and self-consciousness; concern about the implications of being big; and being worried about losing the weight gained. Four women with excessive weight gain and two with normal gain said they did not want to get big or gain weight. Debbie (E) said, "*Well I had a lot of weight gain. I was kinda, I didn't want to have weight gain but it was just coming on and there was nothing I could do about it*" (Debbie, p.2). Kate (E) did not want to get as big as other pregnant women: "*A lot of other people that have been pregnant hey and then they have their baby and they're just like big hey, like big, big hey. And then when I was pregnant I didn't want to get that big*" (Kate, p.2). Julie (N) knew she had to gain weight but did not want to gain too much: "*I knew I was gonna gain*

*weight. I'm already quite heavy. I knew it was, like I had to gain weight but I didn't want to gain too much. So it bothered me*" (Julie, p.1). Not wanting to get big is consistent with DiPietro et al.'s (2003) finding that approximately 43% of women with excessive weight gain and 37% of women with normal gain were worried about getting fat during pregnancy.

Two women with excessive weight gain and one with normal gain mentioned that they were depressed about their weight gain. Fay (N) said "*I was really depressed about it*" (Fay, p.12). Olivia (E) said, "*When I started gaining weight I, well I tried to keep it at a, like a, I didn't want to gain weight so fast. Like I felt a little bit depressed about it at first because it's just you know your body changed so, kind of fast*" (Olivia, p.2). Ruth (E) said, "*any bit of weight that I gained depresses me*" (Ruth, p.2).

Julie and Debbie reported that their weight gain had implications for their self-consciousness and self-esteem. Julie (N) said, "*At first I was ok but then when I started to show I was starting to feel really self conscious about my weight cause I was already quite heavy to begin with. And the last thing I wanted was to be really heavy, to you know gain weight*" (Julie, p.1). Debbie (E) said, "*I didn't like it [gaining weight] and it made me feel, made me feel. I wasn't as self-confident, self-esteem kinda went down*" (Debbie, p.2).

Two women discussed the implications of being big as the reason they did not want to gain weight. Carrie (N) did not like being big because she gets tired more quickly when she's big compared to when she's thin:

> *I like being slim so I can like do things more longer because when you're big you get tired faster and use more of your energy, you have to rest. When you're*

*skinny you can move a lot faster and do more things longer. That's why I like being skinny, not really big.* (Carrie, p.3)

Carrie also did not want to get big because she did not want to have to spend money on clothes: "*I didn't wanna gain so much so I don't have to buy that many clothes and all that. . . . It's just, just like a problem. (laughs) A big problem to me, like, like gonna spend more money* (Carrie, p.23).

Olivia (E) was concerned that being big might affect her ability to care for her baby:

*I just thought you know if I were to get too [big] it might affect like you know the care for her, taking care of my baby like I might be a little bit too lazy. . . . Like having like more weight on me, like not really being used to it I should say. Like I'd feel like it will just slow me down.* (Olivia, p.7)

Two women with excessive gain and three with normal gain discussed how hard it is to lose weight or were worried about being able to lose the weight they gained in pregnancy. Fay (N) said, "*Like hearing in the prenatal classes that it was hard to lose after you have your baby if you gain too much and I was worried about that*" (Fay, p.1). Debbie (E) said, "*I didn't wanna have a whole lot of extra fat to try and lose and not be able to lose it*" (Debbie, p.18). Julie (N) said, "*It's very hard for me to lose weight to begin with. And then I knew that if I gained weight there's a possibility that it could be longer, could be even harder for me to lose*" (Julie, p.1).

Being worried about not being able to lose the weight they gain in pregnancy or maintaining extra weight postpartum is consistent with other studies (Armstrong &

Weijohn, 1991; Fairburn & Welch, 1990). In fact, 72% of the women in Fairburn and Welch's study reported a fear of not being able to return to their prepregnancy weight.

Two women in each group who had negative feelings towards their bodies and gaining weight reported that they were intentionally trying to gain less weight. Anna (N) sometimes ate only one meal per day when she felt like she was fat or gaining too much weight: "*Sometimes I wasn't eating like I should have. I would maybe just eat once a day. . . . Well it wasn't all the time, it was just like sometimes I would feel like I was gaining too much weight*" (Anna, p.18). Anna was the only woman who displayed drastic, restrictive behaviours, and it was not for the duration of her pregnancy. This is consistent with the literature that suggests dieting is uncommon during pregnancy (Davies & Wardle; Fairburn & Welch, 1990).

*Others' influence on body image.* Four women with normal weight gain discussed how others' comments influenced their feelings about their body either positively or negatively. The impact of others' comments and feedback about weight gain will be discussed in the *Social Environment* section. Other ways that people influenced women's feelings about their body during pregnancy are discussed in this section.

Carrie and Anna compared themselves to others which influenced how they felt about their bodies. Carrie (N), who expressed negative feelings towards her body, compared herself to her friends who were skinny and this made her feel fat: "*All your other friends are skinny and you just think that you're fat*" (Carrie, p.2). Anna (N) also saw skinny women and wanted to look like them: "*It would just be like some people I would see that, with really nice figure and I would wanna look like that or be like that.*

*The way I would look at myself I would think I'm fat*" (Anna, p.18). Julie (N) said she felt self-conscious about her body during pregnancy because of her husband's lack of affection: "*Like he [husband] wasn't as romantic. . . . He was scared to touch me so I kinda felt a little bit rejected*" (Julie, p.1).

*Positive or Neutral Feelings*

In contrast to those who had negative feelings, some women felt positive or neutral about their bodies and about gaining weight. Two women with excessive weight gain and one with normal gain had positive or neutral feelings towards their bodies and three women with excessive gain and two with normal gain expressed positive feelings towards weight gain. Although many women experience a negative body image during pregnancy, the literature also suggests that some women are satisfied with their bodies. For instance, 30% of women in Fairburn and Welch's (1990) study were less concerned than usual about their weight while they were pregnant, and 46% were not at all concerned about their weight gain.

Pregnancy may actually result in greater body image satisfaction (Clark & Ogden, 1999). It has been reported that pregnancy gives overweight women a legitimate reason to be overweight (Fox & Yamaguchi, 1997; Wiles, 1993). Fox and Yamaguchi found that overweight women had a positive body image change during pregnancy and Wiles reported that overweight women viewed pregnancy as a socially acceptable reason to be fat, and felt less pressure to conform to society's 'ideal' thin form. Consistent with these studies, all women who had more positive or neutral feelings about their bodies were overweight prior to becoming pregnant and four of the five women who had positive

feelings about gaining weight were overweight prior to pregnancy.

*Positive feelings about their bodies.* Sally and Olivia both reported feeling ok about their bodies and believed the changes they were going through were a natural part of being pregnant. Olivia (E) said, "*I was ok with it [her body], it was just a natural phase of being pregnant*" (Olivia, p.1). Sally (N) said, "*I felt ok with my body and all the changing, all the changes that I was going through*" (Sally, p.1). She also said, "*I just think the way I felt about my body and being pregnant it just stayed the same. I guess I just thought it was all a part of being pregnant*" (Sally, p.16). Sally attributed her positive body image to her good self-esteem. She said, "*There's probably a lot of women out there that really feel down about how much they gain. And it didn't really bother me because like I have a good self-esteem*" (Sally, p.9).

*Positive feelings about gaining weight.* Three women with excessive weight gain and two with normal gain expressed positive feelings about gaining weight. The three women who gained excessive weight had also expressed negative feelings about weight gain. Carrie (N) figured it was ok for pregnant women to gain weight and be overweight: "*I just always figured that it's ok to be fat because it's ok to be fat, gain weight because you just finished having a baby. . . . Like my cousins and my sisters, like they talk about being so fat and they're* ***ok*** *with it*" (Carrie, p.8). When asked how it made her feel knowing she had to gain weight, Alex (N) said: "A*ctually I didn't, it wasn't too bad. I just, I knew that's what I had to do so I didn't really think any further than that. So it wasn't too bad*" (Alex, p.2).

Kate (E) was happy that she was gaining weight because she felt this meant the baby was growing:

*Like the thing that like made me happy was I was getting bigger hey cause like all that time I was like I was just small hey so I figured well my baby's growing, he's like stretching my body so he's growing more. So that's the way I am too with it hey, just figured well my baby is getting bigger so that's why I'm getting stretch marks and stuff* (Kate, p.3).

Two women with normal weight gain and one with excessive gain felt indifferent about weight gain. Val (E) had also expressed negative feelings and Alex (N) had also expressed positive feelings. Alex said: "*I never really paid attention to my weight. I've just always been somebody, if you don't, here I am if you don't like me too bad*" (Alex, p.14).

*Summary*

Women expressed both negative and positive or neutral feelings towards their bodies and gaining weight. Overall, more women in each group expressed negative feelings compared to positive feelings. More women with excessive weight gain ($n = 7$) expressed negative feelings about gaining weight during pregnancy compared to women with normal gain ($n = 3$). However, equal numbers of women with excessive and normal weight gain expressed negative feelings about their body during pregnancy. Similar numbers of women with normal and excessive weight gain expressed positive or neutral feelings about their bodies and gaining weight.

### *Personal Characteristics*

Another theme that became evident in the interview data was *personal characteristics*. These include cravings, food preferences, and factors related to women's physical state of pregnancy, which all had implications for weight gain.

#### *Cravings and Food Preferences*

*Cravings.* Five women in each group reported having food cravings during pregnancy. The fact that most women had cravings is consistent with the literature that has found dietary cravings to be common in pregnancy (Fairburn & Welch, 1990; Pope et al., 1992). Cravings have not been studied in relation to weight gain.

Julie (N) explained cravings as resulting from her body wanting certain foods: "*It seems to be the kind of foods that my body wants to eat and I don't know why*" (Julie, p.5). Carrie (N) explained her experience with food cravings: "*Your body it's kinda, it's just like, I don't know how to explain, like somebody challenging you or something. Like you have to fight it, you like, you have to like, you have to fight it. If it beats you, it makes you eat more*" (Carrie, p.14). Carrie further described her experience with cravings and mentioned getting frustrated when she could not get the foods she was craving:

> *Like you crave for things and you just like, you get mad if you don't have it and you want it. (laughs) I just don't like feeling like that when you're pregnant. . . . Like kinda being mad and you want it but getting mad at somebody to go get it you know. Just kinda like craving, you have to have it like no matter what. If you have get it you start getting mad or you just like keep getting involved with them, start begging, "can you go get me some?"* (Carrie, pp.5-6)

Only two women reported craving healthy foods. Sara (E) craved foods such as salad and bananas; however, she also craved chips and pop. Julie also (N) craved healthy foods: "*During my pregnancy it was pretty much, I craved like yogurts, oranges. . . I craved more nutritious, better, craved for like better foods*" (Julie, p.5). Craving healthy foods likely contributed positively to the nutritional quality of these women's diets.

The majority of women craved foods of low nutritional value. Four women with excessive weight gain and three with normal gain craved foods such as chips, chocolate, pop, fast food, and sweets. For example, Val (E) craved high sugar and high fat foods such as pop, chips, and fast food: "*Just like junk food. Like pop and chips, fast food. That's what I was really craving for*" (Val, p.6). Fay (N) explained that when she craved chips and bars she had to have them despite knowing that she should not be eating junk foods:

> *Like chips and bars . . . I didn't eat much of them but like I'd catch myself and I'd start feeling like greedy. . . .When I eat like that I just like I feel like I shouldn't be, I know that I shouldn't be eating like that but I like I'd crave them and I'd have to have them.* (Fay, p.8)

It was clear that food cravings influenced women's eating during pregnancy and made it difficult for those who craved unhealthy foods to follow a healthy diet. When asked what made it hard for her to eat a healthy diet, Julie (N) said: "*The cravings. That's when the bag of chips would come in*" (Julie, p.14). When asked what makes it hard for women to watch what they eat, Debbie (E) said: "*I'd have to say the cravings. Ya I think it's the cravings that makes it hard for a lot of pregnant ladies*" (Debbie, p.8).

Both Debbie (E) and Fay (N) ate more fast food during their pregnancies as a result of their cravings. Debbie said she rarely ate in fast food restaurants before her pregnancy but because of "*being pregnant, wanting to eat right now or just like certain cravings for stuff*" (Debbie, p.5), she ate more fast food during pregnancy. Debbie also discussed how she had a lot of cravings for sweet foods which she was unable to satisfy with small amounts, rather she ended up overindulging: "*There was lots of cravings. And I think that's what I did, I gave way too far into my cravings like I didn't just satisfy it I just overindulged. . . . Anything sweet I had a craving for*" (Debbie, p.4).

Three women with excessive weight gain and four with normal gain discussed ways to manage or fight their cravings for unhealthy foods. Alex (N) suggested strategies such as eating a licorice or a scoop of ice-cream to satisfy cravings: "*I would eat licorice or, have one licorice or a scoop of ice-cream. . . . When I did the one scoop of ice-cream, the spoonful I'd suck on it, I'd eat it slowly so that it would actually get my cravings*" (Alex, p.8). Debbie (E) thought women should try to just satisfy their cravings by eating a small amount instead of overindulging.

> *Well you can't make them go away but like I was told just satisfy you're craving enough and not overdo it with the craving, just satisfy it to where it's not, where you're not craving it anymore you know. Like if you're craving chips, don't go out and get a great big bag of chips, get a small bag. With ice cream don't go out and get a great big bucket of ice cream cause you know that it's there and you're gonna go back for more. I think it's just you have to you know buy in small amounts, that's what would help.* (Debbie, p.8)

Julie (N) tried eating healthier foods that would still satisfy her cravings, for instance she would have peanuts instead of chips to satisfy cravings for salt:

> *Like a lot of times my cravings would be like I need a salt, something salty so I'd try to go to, grab a bag of peanuts instead of the chips because the peanuts are a little bit better for you than the chips are. So, if I had a bag of chips yesterday because of a craving I would try not to have a bag of chips the next day. I'd try and find another replacement for it that had a little bit of salt in it that I was craving. So that's where the bag of peanuts would come in. Or there's that, you can get this snack mix that the Nutman that has pretzels and, what else, some kind of little crackers in there. I would grab those too instead of the chips. And I'd try to limit myself on how much.* (Julie, p.14)

*Food preferences.* Women described their dislike for healthy foods and preference for junk foods as barriers to healthy eating. Four women with normal weight gain and two with excessive gain mentioned that their dislike for healthy foods made it difficult to follow a healthy diet. Val (E) tried to eat healthy when she was pregnant but she was not able to continue for the duration of her pregnancy because she could not stand the healthy foods and thought healthy eating was boring.

> *I didn't really eat healthy before I got pregnant. But when I got pregnant people kept telling me you can't eat this you can't eat that. So I* ***tried*** *and I kept you know. It really got boring. (laughs) I couldn't stand it anymore. That's why I didn't want to breastfeed too. Cause I wanna eat what I wanna eat and whatever I eat it has to go into him and I don't want it to affect him. So that's. It was pretty good for awhile until I couldn't stand it any longer (laughs)."* (Val, p.5)

Val described the type of diet she could not stand as including fruits, vegetables, milk, soup, sandwiches, limited salt, and only milk or water to drink. She found healthy foods too plain and wanted to be able to eat fast food: "*I tried I really tried eating healthy. (laughs) But it was so hard oh, trying to eat all those vegetables and fruit all the time so. . . .I don't know it was too plain. . . . Like I'm so used to eating like take-out. Eating whatever*" (Val, p.10).

When asked what made it hard to eat a healthy diet, Kate (E) said:

> *Well I really didn't have, like I don't really eat like good foods. So it was kind of hard, that was why it was hard. Cause I don't eat, I don't really eat vegetables and the only vegetables I eat is salad and carrots and stuff like that but I don't really, even now I don't really eat healthy.* (Kate, p.21)

Julie (N) said it was hard to eat a healthy diet because she felt she could not have much variety: "*I was getting tired of the same foods and just getting tired of eating, and not much variety*" (Julie, p.12).

Two women from each group mentioned that their preference for junk food affected their eating. For instance, when asked what made it hard for her to eat a healthy diet, Alex (N) said: "*Not wanting to. I want the junk food, I don't want the healthy food, I wanted the junk food*" (Alex, p.18). Debbie (E) explained why she thought she ended up overindulging instead of just satisfying her cravings because: "*I guess just because it tasted good, just wanna to keep on eating it*" (Debbie, p.10).

Three women mentioned prepregnancy eating habits as influences on healthy eating during pregnancy. Julie (N) found it easy to eat healthy during pregnancy because she was used to eating healthy from having Impaired Glucose Tolerance.

*For me it wasn't too bad because I was already in the habit of trying to eat a healthy diet because of the impaired glucose. It was just trying to make sure I didn't miss a snack or a meal or it would have an impact for my sugars level. It was really good to have healthy nutritious meals and at home we'd have yogurt, salads and we tried to follow the Canada Food Guide. So it wasn't too hard for me.* (Julie, p.5)

In contrast, Ruth (E) thought her prepregnancy eating habits made it hard for her to eat healthy and gain a lower amount of weight in pregnancy: "*I already had my habits, eating habits like you know. And then I had to change, then I'd slip sometimes*" (Ruth, p.9). Debbie (E) felt that women's upbringing determines how they eat. If women were brought up eating junk food then they would continue to do so:

*I'd just say if you were brought up eating healthy then it's just something, well if you're brought up eating healthy or eating junk it just sticks with you. I don't know, I don't really think it has anything to do with the community, the way that your eating habits were when you were being brought up.* (Debbie, p.14)

In summary, women's cravings and food preferences appeared to be important influences on eating for women with normal and excessive weight gain. The majority of women experienced food cravings, craved unhealthy foods, and said cravings were a barrier to healthy eating. Similar numbers of women in each group had strategies to help manage their cravings. As well, many women described their dislike for healthy foods and/or preference for junk foods as barriers to healthy eating. Cravings and food preferences clearly interfered with women's efforts to act on their beliefs about the need to eat healthy and avoid junk food during pregnancy.

*Physical State of Pregnancy*

Most women ($n$ = 5 in each group) mentioned their physical state of being pregnant as a barrier to physical activity. The factors resulting from pregnancy that hindered physical activity included: being big; pain and discomfort; medical conditions; and fatigue.

*Being big.* For two women with excessive gain and one with normal gain, pregnancy was a limitation to physical activity because of being big. For instance, Carrie (N) felt it was difficult to exercise because of being too big: "*Well you can't like hang out with your friends and like run and can't go outside, can't exercise good (laughs). You're too big*" (Carrie, p.2). Sara (E) also felt she could not participate in certain activities because of being too "*big and heavy*" (Sara, p.2). Alex (N) felt that being big makes women feel lazier and less willing to be active, although she did not mention that her own physical activity was influenced by this:

> *The weight could have something to do with it because being bigger you feel lazier and you don't want to get out and move so you just want to sit there and be docile for awhile. (both laugh) I find ya, the bigger you are the less you want to do and the lazier you feel.* (Alex, p.14)

*Pain and discomfort.* Four women with excessive weight gain and one with normal gain mentioned that pain or discomfort from their pregnancy limited their physical activity. Val (E) enjoyed walking during her pregnancy but throughout the course of her pregnancy, she was able to walk less and less due to discomfort from being heavy.

*Well I enjoy, I just started walking. So I'd do like walking on the track for awhile. But after a while oh I was too heavy. I couldn't even, I'd usually go about maybe four laps around the track then I went down to three then I went down to two cause there was so much pressure at the bottom. So I find that doing exercise was good but all I could do was maybe walk around.* (Val, p.3)

Val said, "*It's really hard to start doing things cause of the pressure towards your belly and your bladder. Cause it really pushes down there. (Interviewer: Right) I felt like I had to have something to hold (laughs), to hold my belly down there just to try and walk*" (Val, p. 13).

Sally (N) reported that she was limited in the amount of walking she could do because of back and hip pain: "*I had a lot of well basically back pain and my hips would hurt and there's like I couldn't, there's nothing they could do for me so they basically told me to watch what I do, and not lift heavy things. And like basically the walking too*" (Sally, p.4). Sally's doctor told her to limit her walking to 20 to 30 minutes per day. Olivia (E) said should could walk only limited distances because her ankles would hurt and she did not want to hurt herself: "*My ankles would kinda hurt and I didn't you know, you can walk so far and then you just, or for so long. You just don't wanna hurt yourself*" (Olivia, p.4).

*Medical conditions.* Three women in each group mentioned medical conditions including high blood pressure, shortness of breath, contractions, and swelling as limiting their ability to participate in physical activity. For instance, Val (E) reported having to take it easy because of her high blood pressure and having to keep her legs elevated because of her swollen feet:

*Just mainly walked. Maybe housecleaned a bit but just to keep you going. But I had high blood pressure so I had to (..) take it easy. (laughs) My feet were just swelling . . . . I had to always keep them up and couldn't go anywhere. Couldn't do anything. Had to keep my legs elevated* (Val, p.5).

Julie (N) was on prescribed bed rest, then light activity because she was having early contractions:

*I started off going for, I was walking to begin with before I knew I was pregnant and I tried to maintain that but I think due to my age and stresses at work I had to, I was on bedrest for awhile. So I had to leave [work early]. . . . It went from bedrest to light activity so I did like light housekeeping, what I could. It's just I started having contractions early so that's why I was on bedrest.* (Julie, p.4)

She attributed the contractions to stress at work and said when she stopped working, she was able to do more activity. Even after receiving advice from her doctor to walk everyday, Sara (E) did not do so because she said her "*legs are always swelled up*" (Sara, p.7).

*Fatigue.* Fatigue was included in this section because the pregnancy state partially contributed to fatigue; however there were also other causes of fatigue, unrelated to pregnancy. Regardless, a number of women discussed the impact of fatigue and laziness on physical activity. Two women with normal weight gain and four with excessive gain said that their fatigue or lack of sleep prevented them from getting physical activity. Sally (N) said, "*It[physical activity] was fun, I enjoyed it but it was kind of hard because there's only so much you could do and you'd get tired*" (Sally, p.3). Olivia (E) was not sleeping well at night which resulted in her being tired during the day

and prevented her from doing the amount of activity she wanted to do. Her lack of sleep also made her tired during physical activity so she could walk only limited distances.

> *I wish I could've done more physical activity, it's like you do get tired and I guess thought I could've done more physical activity, or walking I should say. . . . Like, though I did, it wasn't enough I feel. . . .I just was kinda like, cause I don't sleep as much and I, like I'd just get sleepy tired when I'm walking and I'd just go for so long. And then I'd come back and rest. . . . It's just kinda, your day's pretty much shot cause you don't sleep as good at night. More closer to your due date too.* (Olivia, p.5)

Olivia also said that being busy with school made her tired which prevented her from getting much physical activity:

> *I was going back to school for the summer and then I was pretty busy with school and then again I never really got to rest. And that made me think well and I was thinking that when I was in school, that made me tired and that's why I probably didn't do so much walking too. Cause even though I wasn't physical doing you know stuff I just was tired after, when I got home.* (Olivia, p.8)

Similar to women's beliefs about of the influence of fatigue on physical activity, Eyler et al. (2002) found that fatigue is associated with physical inactivity among women of various ethnic origins, including American Indian women, although this was not specific to pregnancy.

Four women in each group thought that laziness influenced their physical activity. For example, Val (E) noted that her laziness influenced her activity: "*I could just go out and go for a walk but I don't know. I'm just too lazy*" (Val, p.14). Sara (E) said she did

not go for many walks because she was lazy and always sleeping: "*Always sleeping and they'd say to always go for walks but I hardly went for walks. I was lazy*" (Sara, p.4). Sara also attributed her activity level and feeling lazy to smoking during her pregnancy:

> *When I was pregnant with her, I like I smoked cigarettes with her. Like not all the time, two like in a day. . . . My weight was with the smoking. That like gets me lazy, that's why I'm like always lazy, tired. . . .When you smoke it gets you kinda like tired, lazy. That's how I was when I was pregnant.* (Sara, p.13)

In conclusion, there were a number of personal characteristics that created barriers to women's ability to be physically active. These were related to women's pregnancy state. Despite the fact that all women believed physical activity was beneficial for pregnancy, the pregnancy state made it difficult for some women to participate in activity. Similar numbers of women in each group mentioned being big and medical conditions as being limiting factors for physical activity but more women with excessive weight gain mentioned pain and discomfort as limiting factors. Twice as many women with excessive weight gain ($n = 4$) said that fatigue limited their physical activity, but equal numbers in each group mentioned that their laziness limited their activity.

*Summary*

There were several characteristics that influenced women's eating and physical activity, including cravings and food preferences, being big, pain and discomfort, medical conditions, and fatigue. In most cases, these characteristics were barriers to healthy eating or physical activity. Few differences existed between the groups.

### *Personal Desire and Motivation*

Personal desire and motivation were central to women's efforts to eat healthy and be physically active. Personal desire refers to whether or not women wanted or were willing to eat healthy or be active, and motivation refers to women's level of stimulation to eat healthy or be active. This section reveals women's beliefs about the role of desire and motivation on eating and physical activity as well as the influences on women's desire and motivation.

#### *Desire and Motivation for Healthy Eating*

Three women with normal weight gain discussed the influence of personal desire or motivation on eating. Julie (N) felt that women who are not willing to watch what they eat or make a conscious effort to eat healthy will simply eat whatever they want. She thought weight gain depends on the following:

> *How much they're willing to do to watch their weight gain. Like if they're willing to work, go for walks everyday and watch what they eat and stuff like that. Whereas if they don't feel like, you know some don't really care and they just eat whatever they want and not really care about exercising. Or making a conscious effort about that.* (Julie, p.12)

Anna (N) discussed how some women are more motivated to eat healthier foods than others: "*Some women just like intend to live, like not healthy food as for other women they will live more on the healthy stuff like not so much of the not healthy food*" (Anna, p.12).

*Influences on desire and motivation for healthy eating.* There were various reasons that women were willing or motivated to eat healthy. The most important motivator was to promote the baby's health, and the second most important was to prevent diabetes or the need for insulin. Only two women with excessive weight gain and one woman with normal gain were motivated to eat healthy in order to control their weight gain. For instance, Olivia (E) said: "*I kinda changed the way I like ate just so the pregnancy wouldn't be so hard and I wouldn't gain an unhealthy weight, like unhealthy as in I'll be, I'll have more weight on me after I'm pregnant*" (Olivia, p.6). Olivia, however was not always thinking about controlling her weight gain. She thought that if she had consciously thought about trying to gain a lower amount of weight, this may have helped her to gain less weight. When asked what made it hard for her to gain a lower amount of weight, she said, "*Just kinda not really keeping it in mind that. . . . Well just not keeping it in mind and having to be at work, school and having to do other stuff that are on mind, ya. . . . It would've changed how I ate*" (Olivia, pp.15-16). Ruth (E) mentioned that she watched what she ate more during pregnancy because of how she felt about her body: "*Well, the way I felt made me watch what I ate more than I do now*" (Ruth, p.14).

Five women with excessive weight gain and three with normal gain mentioned that their eating was affected by their thoughts and concerns about their baby. Val (E) said that thinking of the baby motivated her to eat healthy foods:

> *Like I didn't eat bran and I tried eating bran, brown bread and stuff. And it was hard but I was thinking of the baby. The baby has to eat healthy. . . . So I was thinking of the baby when I was pregnant. What I eat and drink this is what he's*

*gonna be eating. I really like I said I really thought about him when I was taking in.* (Val, p.12)

Debbie (E) explained what helped her to be able to eat healthy: "*Well for me it was more the fact that I wanted to have, to ensure that the baby's health is good. I think that that's what would help them. Just to make sure you're gonna be having a healthy baby, eat right*" (Debbie, p.7). Ruth (E) said, "*It gave me, gave me incentive to eat better cause I was thinking of her [baby's] health*" (Ruth, p.4).

Four women with excessive weight gain and two with normal gain were motivated to eat healthy in order to avoid getting diabetes or having to go on insulin. The prevalence of type 2 diabetes is 5.3 times higher among Aboriginal women compared to the Canadian average (First Nations and Inuit Regional Health Survey National Steering Committee, 1999) and the prevalence rate is still rising among Aboriginal populations (Young et al., 2000). Statistics on the incidence of diabetes for Aboriginal people from Southern Alberta were not found. However, given the number of women in the present study who were concerned about getting diabetes, the prevalence is likely relatively high.

Julie (N) discussed what helped her to eat the way she did: "*Well I was thinking about the baby's development mainly and then like I didn't want to go on insulin. Because I found my sister she had to go on insulin and it was such a rigid regime*" (Julie, p.7). Julie also said, "*My health is already compromised because of the impaired glucose so I had to be very conscious of what I put in my mouth*" (Julie, p.10). Julie's desire to prevent gestational diabetes also enabled her to refuse advice to eat for two:

*My mother-in-law would always tell me "You know you're eating for two, you need to eat and get lots of rest." . . . But just because of knowing what I know now*

*and because of the medical problem, like the chronic condition I already have, I didn't want to start listening to them because I didn't want to go on insulin. And I didn't want to have to really be put on a very strict diet because of developing gestational diabetes. I didn't want that, so I was trying to prevent that.* (Julie, p.15)

Ruth (E) explained why she ate better during her pregnancy than she did previously:

*My two sisters got gestational diabetes and I didn't want to get that so I totally switched my eating habits. . . . Like I'm not one for fruits and vegetables and stuff but I made sure I ate fruits and vegetables and like whole wheat bread and you know like they tell you to.* (Ruth, p.3)

Olivia (E) also explained why she made many positive changes to her diet during pregnancy: "*Well just hearing about diabetes and you know, like becoming a diabetic after or you know during pregnancy*" (Olivia, p.7). In addition to being concerned about herself getting diabetes, Kate (E) was worried about diabetes being passed on to her baby. She said she watched what she ate to prevent her baby from getting diabetes.

*I didn't want to get diabetes cause you know diabetes runs in my whole family hey like all my aunties, my uncles they mainly all have it hey. . . . So I'm trying to like not fall into that because like my baby hey I don't want him to get diabetes. Like it could easily be passed on to him. So that's why I just chose like to try and keep it controlled like my eating, I kinda watched what I ate.* (Kate, p.3)

Alex (N) actually had gestational diabetes, and this played an important role in her eating. She said her eating "*changed completely*" (Alex, p.6) when she found out she

had diabetes. She explained the reason she changed her eating and physical activity: "*Cause I didn't know the affect that it [diabetes] would have on my unborn child. So I just thought if I do exactly what I was supposed to do then everything should be ok and she should be born fine. So that's basically why I did all that*" (Alex, p.14).

*Desire and Motivation for Physical Activity*

Four women with normal weight gain and three with excessive gain mentioned that being physically active is related to one's personal desire or motivation. When asked what could help women to eat healthy and exercise, Ruth (E) said:

> *I think it's just within themselves. I'm one for exer- like I walk, I exercised before I got pregnant but as soon as I got pregnant I just wanted something to better myself for my child. I think it just comes within themselves. Cause there's nothing really you can do you can't force someone. You know, it's their life, their way of living. I don't know just themselves I guess.* (Ruth, p.5)

Alex (N) said "*just wanting to do it*" (Alex, p.12) would help women to be able to exercise. She explained what she thought would make women want to do it:

> *It all depends on the type of person they are. If they are someone who worries about what they look like all the time then they're gonna be someone who goes out and exercises. But if they're not, then they're not gonna really worry about it. . . . It's mainly a want.* (Alex, p.12)

When asked if there is anything that could help women to be more active in pregnancy, Fay (N) said, "*I guess it's just up to them if you know, can't really tell anybody what to do. It's really mainly up to them*" (Fay, p.8).

Sally (N), Val (E) and Kate (E) mentioned the need to put one's mind into it and to force oneself to get physical activity. When asked what would help women to get more activity, Sally said, "*putting their mind to it*" (Sally, p.7). Kate said "*You get lazy and you don't wanna do anything, you just wanna lay there and eat and sleep. Me I tried to do different hey. Like other times I'd be really tired and I wouldn't wanna get up but I'd force myself to get up and do something*" (Kate, p.8).

Consistent with women's beliefs about the influence of motivation on physical activity, Eyler et al. (2002) found an association between physical activity and motivation. Specifically, a lack of motivation was found to be negatively associated with physical activity among ethnically diverse, non-pregnant women.

*Influences on desire and motivation for physical activity.* There were various reasons that women were willing or motivated to get physical activity including to control weight gain, to have an easier labour, and for the baby's health. Similar numbers of women were motivated to prevent a difficult labour and control weight gain. Preventing diabetes and thinking of the baby were mentioned by fewer women. Two women with normal gain and one with excessive gain mentioned that they were motivated to do physical activity in order to control their weight gain. Fay (N) described what motivated her to be active: "*Well just knowing that like, hearing that because like I was overweight like they say that it's harder to lose weight after you're, after you're pregnant*" (Fay, p.8). Debbie (E) said that not wanting to be big motivated her to exercise more: "*I don't wanna be big and have all this fat on me and that's what kinda affected me wanting to exercise. I didn't wanna have a whole lot of extra fat to try and lose and not be able to*

*lose it*" (Debbie, p.18). She also said "*I started exercising to help me not gain so much*" (Debbie, p.2).

Alex (N) was motivated to do physical activity to control weight gain but also to control her diabetes. She was the only woman who mentioned being motivated to get physical activity to control her diabetes. She explained why she did more activity when she was pregnant compared to before: "*Just so I wouldn't gain so much weight. To maintain my diabetes*" (Alex, p.5). Alex also said: "*I really worked on it. I exercised, I would go for walks on a daily basis and I'd, so I tried to maintain it for the diabetes and the baby. Cause if I didn't maintain the diabetes then the baby, it would affect the baby*" (Alex, p.3).

Three women with excessive weight gain and one woman with normal gain said that thinking about labour influenced their level of physical activity. Olivia (E) said she was motivated to do physical activity in order to prevent having a cesarean section: "*What kind of motivated me was like having you know the goal of trying not to have cesarean and walking was one thing that could prevent that. So I just kept in mind you know not to have a cesarean so I walked*" (Olivia, p.11). Ruth (E) was motivated to get physical activity in order to prevent pain during labour even when she did not feel like being active:

> *Just thinking of her, like, and I was scared of the birth you know, like the pain and all that. And like everybody, like my mom would tell me well if you get out there, if you're active it won't be so bad. So that's what motivated me. Cause I was terrified of the pain.* (Ruth, p.10)

Two women with excessive weight gain said that thinking about their baby motivated them to get physical activity. For instance, Ruth (E) believed that physical activity helps the baby to be healthy and strong: "*Just you know, health wise, like I wanted a healthy baby. And working out, I was told like gives you, helps you have a strong, healthy baby"* (Ruth, p.10). Val (E) said she thought about her baby as well as labour: "*Well me, I have to force myself. But like I said I was thinking of the baby. How he was gonna come out, how easy it was gonna be*" (Val, p.12).

*Summary*

Women discussed motivation and personal desire as influences on healthy eating and physical activity. There were various influences on women's desire and motivation for eating and physical activity. Few women in each group mentioned being motivated to eat healthy in order to control their weight gain. More important motivators for eating healthy included thinking about the baby and preventing diabetes. Similar numbers of women mentioned controlling weight gain and preventing difficult labours as motivators on physical activity. Few women mentioned thinking of the baby and avoiding diabetes as motivators for physical activity.

### *Stress*

All of the women who gained excessive weight during pregnancy and all but one woman with normal weight gain mentioned having stress in their lives when they were pregnant. The influence of others on stress will be discussed in the *Social Environment*, and financial influences on stress will be discussed in the *Economic and Physical*

*Environment*. Other influences on stress for women who gained normal weight included not being ready to have another child, a friend's death, and medical issues. For women who gained excessive weight in pregnancy, other influences on stress included noise and heat, being concerned about the baby's health or appearance, and being worried about raising a baby. In this section, the implications of stress relating to weight gain will be discussed.

Two women with normal prenatal weight gain and one woman with excessive gain discussed how stress made them less motivated to take care of themselves. Alex (N) said that at times she did not care about eating and just wanted to be left alone because of her stress level: "*It was just to a point where I just wanted to be left alone, I don't care about the eating, I don't care about anything, just leave me alone for awhile. So definitely stress has, stress messes up a lot of things*" (Alex, p.23). Anna (N) said that for a month she was not eating the way she was supposed to and was not caring for herself because she was stressed:

> *Well for me, in the month of July I was like stressed and I didn't, I wouldn't be tired or anything but I didn't gain any weight at all through that whole month. I didn't gain any weight, I just stayed the same. . . . I think it was just me because I wasn't eating as much, like the way I was supposed to be, I was just eating very little. Not really caring for myself at the time.* (Anna, p.16)

Olivia (E) thought that stress and having too much on one's mind might result in less willingness to help oneself: "*Psychologically like too much on your mind, you're not really willing to do you know anything to help you help yourself*" (Olivia, p.18).

In addition to mentioning the influence of stress on caring for oneself, women

also described how stress influenced eating and physical activity which will be described in the following sections.

*Influence of Stress on Eating*

Four women in each group mentioned stress as an influence on eating; however the impact on eating was variable. Two women from each group reported that stress caused them to eat less. For instance, Fay (N) said: "*I noticed that I didn't really eat as much with her. And I didn't like really gain as much with her. . . . I think because like I was you know stressed. Worrying about like having, you know having her and not being able to get anything for her right away and not being ready for her*" (Fay, p.6-7).

In contrast, one woman in each group reported eating more as a result of stress. For instance, Ruth (E) described reaching out to food when she was stressed or depressed:

> *I find it's that you're going through all these emotional changes. If you're a stress eater or a depression eater I don't know I think women could get more help with their emotions and cause it is tough, like a roller coaster. And I found whenever I hit rock bottom with depression or feeling (stressed) I'd reach out to food. I don't know that's just me though like I've always been a stress eater.* (Ruth, p.6)

Julie (N) said she tended to eat food when she was stressed after she gave up smoking:

> *When I first found out I was pregnant I was a smoker and so that's how I, a lot of times I dealt with my stress, I'd go out and have a cigarette. But because I was trying to quit, and I did quit, that was another fear is because I quit smoking I'm*

*gonna gain a lot of weight. And so a lot of times when you're stressed out, cause I didn't have that cigarette it would go more towards food or I would eat more.* (Julie, p.16)

Julie thought physical activity would have helped relieve stress but said, "*It's easier to grab something to eat than it is to get up off your butt and (laughs) go for a walk*" (Julie, p.16).

In addition to stress, Carrie and Ruth mentioned other emotions that caused them to eat more. Carrie and Ruth both ate more when they were feeling sad, mad, or depressed. They both discussed reaching out to food when feeling down. Carrie (N) said, "*Like well when you're pregnant you really eat a lot and you really crave a lot. And sometimes you just, you're mad or you're sad and you just eat*" (Carrie, p.9). Ruth (E) said she reached out to food to comfort her when she was feeling depressed: "*I eat for comfort, I'd get depressed and I'd have to fight that*" (Ruth, p.10).

Although stress or emotion-driven eating have not been studied in relation to prenatal weight gain, stress-driven eating is significantly associated with obesity among non-pregnant women (Laitinen et al., 2002). Eating is thought to be a means of coping and making oneself feel better in times of stress or difficult life periods (Laitinen et al.). This is consistent with women's descriptions of eating for comfort when they felt stressed or depressed.

One woman from each group reported that sometimes they would eat more, and other times would eat less as a result of stress. For instance, Alex (N) said she would not eat if she was stressed but then would end up gorging and overeating.

*I believe it [stress] goes hand in hand with weight gain. Cause you know a lot of times if I'm really stressed I won't eat. And then after awhile you just feel so drained after a high time of stress and then I won't eat during that period either because I'm too busy trying to come back to the normal state. And so I find that because I'm not eating, my body's storing everything. Then when you do eat, you tend to gorge. And so then you're overeating. . . . I don't know if you're using a lot of energy when you're stressed and you tend to want sweet things.* (Alex, p.22)

Debbie (E) said the amount of food she ate depended on her level of stress. When she was a little bit stressed she ate more and food made her feel better; however, if she was very stressed she would not eat:

*When I was stressed, it kinda depended on how high the stress was. Like if there was a lot of stress then I wouldn't really eat. But if it wasn't too much, I'd find myself eating. . . . When I was too stressed out it was like I couldn't think of anything else but what was stressing me out and it just made me feel like not eating. And then other times when I didn't have too much stress, I guess I'd have to say that it just made me feel better I guess, if I ate food that I like, made me feel better.* (Debbie, pp.14-15)

Ruth (E) described the influence of stress on weight gain as a result of physiological changes:

*I would see a counselor and he/she'd tell me that like if you're mad your body feeds hormones to your baby. For stress then your body stops yourself from losing weight and, do you know what I mean like? Sends hormones through your*

*body so you won't, don't lose the weight you want or makes you gain weight.* (Ruth, p.15)

*Influence of Stress on Physical Activity*

Three women with excessive weight gain and two with normal gain said they got less physical activity when they were feeling stressed. They felt that stress made them tired and they would end up not wanting to go anywhere or get physical activity. When asked what would have helped her to gain a lower amount of weight, Olivia (E) said: "*If I just wasn't so stressed out, making me tired and then making me not want to do much physical activity, well I tried to but and then you know that stress*" (Olivia, p.15). Val (E) discussed how stress from work affected her eating and activity: "*When I was at work I hardly, I would hardly eat coming home cause I was so, so stressed out at work. I was just getting so stressed out I would just wanna lay down and relax, you're not really active, you don't wanna do anything*" (Val, p.21). Getting less physical activity as a result of stress is consistent with the literature that has found stress to be an important barrier to physical activity (Eyler et al., 2002).

In contrast, two women with excessive weight gain said they got more physical activity when they were stressed because stress stimulated them to be active. For instance, Debbie (E) said, "*I'd have to say that when I was stressed, that's when I felt like working more. . . . like working out more*" (Debbie, p.15).

*Managing Stress and Emotions*

Three women with normal gain and one woman with excessive gain mentioned

that physical activity was a good way to relieve stress as was discussed in *Beliefs about Physical Activity*. Additionally, Fay (N) thought that talking to others would help manage stress.

> *I think if I had told people, the father I mean. If I just told them like it would've helped you know like relieve the stress. You know just someone being there. Like they were there but it's just that I didn't tell them you know what was bothering me* (Fay, p.11).

One woman in each group felt that dealing with emotions would help women to gain normal weight. Both were emotional eaters and ate when feeling angry or depressed. Carrie (N) thought that women may eat too much because they eat when they're sad or mad and suggested strategies other than eating to deal with emotions.

> *Maybe that you shouldn't eat when you're sad or mad just kinda like exercise or do something else but getting mad or sad about it. Instead of eating just like do something, play with your other kids or clean or do a puzzle or something. Instead of crying yourself to sleep, getting mad all day. I recommend that will help. Try not to think like well try not to think about food that much.* (Carrie, p.9)

Ruth (E) reached out to food to comfort herself when she was feeling depressed. She thought that if women could get help with their emotions, it might help them to gain healthy weight: "*Just more support like emotional support. Sometimes you don't even know why you're feeling the way you're feeling. It would help if someone was there to you know explain everything to you*" (Ruth, p.7). She thought having a health professional to talk to instead of family would help: "*It's hard, it's better, easier to talk to*

*someone you don't really know and it's harder to talk to your family. Sometimes they don't have the best advice. Someone with professional advice would help*" (Ruth, 7).

*Summary*

All women with excessive weight gain and the majority of women with normal gain had stress in their lives during pregnancy. Stress had a variable impact on eating and physical activity. Equal numbers of women in each group ate more and ate less as a result of stress. Similar numbers of women in each group got less physical activity as a result of stress, but two women with excessive weight gain actually got more physical activity because of stress.

*Summary*

Personal factors including beliefs, body image, personal characteristics, personal desire and motivation, and stress all had implications for women's health behaviours and prenatal weight gain. Both similarities and differences existed within the themes between women with normal and excessive weight gain. Some of the interrelations between the themes were mentioned, and will be further discussed in Chapter 5. Although individual factors are important influences on eating, physical activity, and prenatal weight gain, they do not act in isolation. The social, economic, and physical environments influenced women's personal factors and acted as mediators for health behaviours. These broader influences will be discussed in the following sections.

## The Social Environment

The social environment had important implications for prenatal weight gain. The themes that emerged from the data relating to the social environment include advice, support for action, and feedback about weight gain. In addition to these themes, the influence of the social environment on women's level of stress will also be discussed.

### *Support in General*

The importance of support in general was mentioned by two women with excessive weight gain and one with normal gain. When asked about support for eating and physical activity, Sally (N) said:

> *I think that's kind of, like it's true that to have motivation and somebody to encourage you and to be supportive and I just think that people, well pregnant people should have more of that, like motivation, somebody to motivate them and to encourage and support . . . it doesn't really matter where the support is or where it comes from, they should have support.* (Sally, p.14)

Olivia (E) also felt that support is important: "*I think it's really good if you do have support like when you're pregnant. Well anything positive can help you when you're pregnant with healthy pregnancy*" (Olivia, p.19). Val (E) said, "*You need all the support you can get*" (Val, p.21).

Social support is an important determinant of health and influence on health behaviours (Health Canada, 2000; Labonte, 1993). Support has been linked to positive prenatal behaviours (Schaffer & Lia-Hoagberg, 1997; Walker et al, 1999) which in turn promote healthy pregnancy outcomes. In a review of the literature on the correlates of

physical activity among diverse ethnic groups including American Indians, Eyler et al (2002) concluded that "social support was an overwhelmingly positive determinant of physical activity for all groups of women" (p.239).

Women's social environments were comprised of relationships with family, friends, and health professionals. In terms of general support, equal numbers of women with excessive and normal weight gain said they had emotional support during their pregnancy and there was little difference between the groups in terms of support for household chores and childcare. There was a difference in marital status between the groups and thus differences in support received from spouses. More women with excessive weight gain were single ($n = 4$) compared to those with normal weight gain ($n = 1$). All other participants were either married or in common-law relationships.

### *Advice*

Advice from others was an important aspect of women's social environments that influenced prenatal weight gain. Advice was composed of two related sub-themes including information and encouragement. Information provided by others was related to weight gain, eating, and physical activity. Encouragement went beyond the provision of information and included advice from others to eat healthy and participate in physical activity. Advice was provided by family, friends, and health professionals. Advice from others had an important influence on women's personal factors such as beliefs and personal desire and motivation. Women's response to advice, however, was not always positive as will be discussed.

*Information*

Informational support is a component of social support (Callaghan & Morrissey, 1993). Information is also a part of pregnancy-specific support which has been shown to be significantly related to positive health behaviours including healthy eating (Schaffer & Lia-Hoagberg, 1997). Pregnancy-specific support is when women feel they have someone to talk to about their pregnancy and to provide them with information that helps them in pregnancy (Schaffer & Sia-Hoagberg). Family, friends, and health professionals provided women with informational support related to weight gain, eating, and physical activity. Information can contribute positively to women's health behaviours and prenatal weight gain. However, as will be discussed, a lack of information also has implications for weight gain.

*Weight gain.* Only two women with excessive weight gain and three women with normal gain said they received information from health professionals about how much weight to gain during pregnancy. For instance, Julie (N) worked with a dietitian to decide on a healthy amount of weight for her to gain: "*I worked with a dietitian some days we worked together and said this would be ok weight for you to gain, like three pounds a week because we wanna make sure that baby's healthy*" (Julie, p.2). Ruth (E) said, "*The doctor said you know, the average weight was 25 to 30 pounds*" (Ruth, p.7).

Four of the five women who reported receiving advice from health professionals received accurate information based on their prepregnancy BMI; however, the weight range recommended to Ruth was high. Ruth had a very high prepregnancy BMI (38.7), thus the maximum weight she should have gained was 25 lbs. Either the health professionals recommended an incorrect weight range or she remembered their advice

incorrectly. In their study, Cogswell et al. (1999) found that 22% of women who received advice about weight gain were advised to gain more weight than the IOM recommendations (IOM, 1990) and most women to receive advice above the IOM recommendations were overweight, which is consistent with Ruth's situation.

One woman with excessive weight gain reportedly received inappropriate advice and five women with excessive gain and three with normal gain reportedly did not receive advice from health professionals about weight gain. Similar to the present study, Cogswell et al. (1999) reported that about half of the participants in their study received either no advice or inappropriate advice about gestational weight gain. For those who did receive advice, actual weight gain was strongly associated with the advised weight gain (Cogswell et al.). When physicians instruct women on appropriate weight gain, they are more likely to gain within the recommended ranges (Cogswell et al.; Taffel et al., 1993). Similarly, in the present study, three out of the four women who reportedly received accurate advice about weight gain from health professionals actually gained appropriate weight. Thus, accurate advice and knowledge about healthy weight gain appeared to be factors that influenced actual weight gain.

The women who said they did not receive advice from others about weight gain either did not have any ideas about a healthy amount of weight to gain or formulated their own ideas based on their experience as was discussed in *Personal Factors*. In Cogswell et al.'s (1999) study, receiving no advice about a healthy weight gain range was associated with gaining outside the recommended weight gain ranges, with more women gaining excessive weight (44.8%) than low weight (25%). This is consistent with the

present study given that most women with excessive weight gain ($n = 5$) said they had not received advice from their health providers.

The women with normal prenatal weight gain who had not received advice about weight gain from health professionals had constructed their own ideas of healthy weight gain based on their previous pregnancies. Most women with excessive weight gain had not been pregnant previously, and thus were not able to base their ideas about healthy weight gain on experience. This concept was explored in *Personal Factors*. Five out of the six women who did not receive information about weight gain from health professionals and formulated their own ideas about healthy weight gain suggested inappropriate weight ranges, most of which exceeded the upper limit. Four out of the five women who received information about weight gain from health professionals were able to suggest an appropriate weight gain range for pregnancy. This suggests that input from health professionals can positively influence women's beliefs about healthy weight gain.

In summary, it appears that information, or a lack of information, about healthy prenatal weight gain is a factor that contributes to beliefs about weight gain and in turn actual weight gain.

*Eating.* Although few women received information about weight gain, many women received information about diet and physical activity from health professionals as well as from family and friends. All women received information from others about eating. Four women in each group received information about eating from family and friends. Six women with excessive gain and five with normal gain received information from health professionals. Information from health professionals involved a brief mention about nutrition during a home visit, nutrition information presented in prenatal

classes, or a session with a dietitian. The types of advice women received from health professionals included information about healthy eating, avoiding salt and sweets, *Canada's Food Guide to Healthy Eating* (Health Canada, 1992) and the number of servings to have, and drinking adequate fluids. Information from family and friends was related to eating for two and types of foods to eat or avoid.

Two women with excessive weight gain and one with normal gain reported receiving advice about specific foods that should or should not be eaten. For instance, Val (E) received advice to avoid salt, to drink water or milk, and to eat fruits and vegetables. She described the advice she received from coworkers:

> *They kept telling me don't eat or don't use salt. You can't eat that it's salty food. (I: ok) Just drink water or milk and your fruit, your vegetables. So that's what I brought to work is maybe a sandwich, soup, fruit, vegetables. Or sometimes I would kinda go to the store and buy something else (laughs) that would satisfy. (laughs) (I: ok) But I stuck to it for a while until (I: ok) I couldn't handle it anymore (laughs).* (Val, p.5-6)

Alex (N) received advice from her sisters about the following: "*What I should eat and what I shouldn't be eating, different types of proteins I could eat. And that was basically it that they would give me advice on. Cause that's mostly my questions is jeez, what am I supposed to eat? (laughs) How do I cook it and stuff like that*" (Alex, p.9).

*Physical activity.* Five women with excessive weight gain and two with normal gain received information from others about physical activity. All the information provided was related to the benefits of physical activity. Five women were told that

physical activity would help with labour, two were told it would help limit weight gain, and one was told that it would help the baby to be healthy.

Val (E) was told about the benefits of physical activity on labour:

> *Well just other people telling me walk because your labour pains are gonna be tough and you need all your strength in your lower legs. Just other people telling me, you know that had kids, what they went through and all that. Cause they were just telling me just to keep walking. So I just went to their advice. Cause they noticed I was getting bigger and they told me just to keep walking and walk and walk. Ok, I'll have to force myself.* (Val, p.18)

Sally (N) was told that walking would make labour faster and easier: "*The prenatal nurse from there [Aboriginal community], he/she told me like to get 20 minutes, or maybe even 40 minutes of walking because the labour would be more faster and easier for me*" (Sally, p.13).

Anna (N) was advised that activity would help with labour as well as weight gain: "*Just well with my first pregnancy I wasn't, I exercised but not as much and I kinda had a hard time through labour the first time. Then my mom told me that if I did exercise it would help with labour as well as the weight gain. I noticed it did help*" (Anna, p.13). Ruth was told that physical activity would influence her baby's health: "*Health wise, like I wanted a healthy baby. And working out, I was told like gives you, helps you have a strong, healthy baby*" (Ruth, p.10).

Interestingly, more women who had excessive weight gain received advice from others about physical activity. Family, friends, or health professionals may have noticed that women's weight gain was high or noticed their physical activity level was low, and

felt it important to provide women with information about the benefits of physical activity. Val (E) said others "*noticed I was getting bigger and they told me to just keep walking*" (Val, p.18). The family, friends, and health professionals of women who gained normal weight may not have felt the same need to inform them about physical activity because they did not notice high weight gain or low levels of activity among these women. It may also be that others did not feel the need to provide information to women with normal weight gain because they had experience with pregnancy; all but one woman with normal weight gain had been pregnant previously. In contrast, all but one woman with excessive weight gain did not have experience from a previous pregnancy and thus others may have felt that providing information was important because it was their first pregnancy.

*Summary.* Women generally received inadequate information about a healthy amount of weight to gain during pregnancy. All women received information about eating during pregnancy from family, friends, or health professionals. The majority of women with excessive weight gain received information about the benefits of physical activity during pregnancy. In fact, more women with excessive weight gain received information about physical activity compared to those with normal gain. It can be concluded that women with excessive weight gain received informational support with regards to healthy eating and physical activity but lacked informational support relating to weight gain itself. The following section will examine the encouragement that women received for health behaviours.

*Encouragement*

In addition to receiving information about eating and physical activity, women also received encouragement to eat healthy and participate in physical activity from family, friends, and health professionals.

*Encouragement to eat healthy.* Encouragement was provided by others to both eat healthy and avoid junk foods. All seven women with excessive weight gain and four women with normal gain received encouragement from others to eat healthy. Olivia (E) said, "*My sister did talk to me a lot about how to, not how to eat but just to watch what I eat*" (Olivia, p.9). Greta (E) received encouragement from her family to eat healthy: "*My family would always tell me to watch my diet because diabetes is really bad*" (Greta, p.7).

Three women with excessive weight gain and one with normal gain were encouraged by family and friends to avoid junk food. Kate (E) explained that when she wanted to eat junk food, her friend would tell her not to:

> *Like cause there was times where I really like just wanna sit there and just eat junk food. A lot of people told me not to do that. . . . My friend [name] told me. And then her husband was staying with her at the time hey and then he'd tell me "What are ya gonna do with all those chips?" you know. (laughs) "Are you sure you're gonna eat all those chips?" eh cause like I'd buy a couple bags of chips and maybe some popcorn or you know maybe some popsicles or just something cause it was really hot up there and it was summertime too.* (Kate, pp.13-14)

Ruth (E) provided an example of how others encouraged her to avoid unhealthy foods:

> *I ran into a friend at the grocery store and I was craving pizza so I bought a pizza and she [said] "oh, you're not supposed to be eating pizza, you're supposed to"*

*you know, so then I would back off. I felt like I had to please everybody else along with myself and the baby.* (Ruth, p.11)

*Encouragement to be active.* All seven women with excessive weight gain and three women with normal gain were told or encouraged by others to walk or be active during pregnancy. Six women with excessive weight gain were encouraged by family members or friends and five by health professionals. Val (E) said she thought getting exercise was good in pregnancy because of what others said: "*Well people would start telling me to do a lot of activity though like do a lot of stuff. Cause it's easier for your hips to go apart*" (Val, p.4). Kate (E) had a friend who encouraged her to walk:

*Well they really, like my friend really, like she was my coach and she really encouraged me to do a lot of walking. She didn't like me to just be sleeping, like eating and sleeping. Cause she said that's where you gain most of your weight is from eating then sleeping, don't do nothing afterwards.* (Kate, p.13)

Debbie (E) also said others were encouraging her to walk:

*A lot of people told me to walk. Cause if I do a lot of walking birth will be easier. . . . Like my grandmother and I'd say my mom and my auntie. Cause they were all telling me to walk when you're pregnant, labour will be easier, won't be as hard.* (Debbie, p.6)

Compared to the seven women with excessive weight gain, only three women with normal gain received encouragement to be active. Two women received encouragement from family members or friends and two from health professionals. Alex (N) discussed the encouragement she received:

*My sister she just wanted me to get out there and walk and, and figured it would be good. She's always on my case about exercising cause she's bigger than me and so she always wants to get out there and get exercise.* (Alex, p.9)

Sally (N) received encouragement to be active from her doctor, the prenatal nurses, and her mother:

*And then another thing was my mom, when my, that prenatal nurse came, my mom was in here and she was in here when my prenatal nurse was talking to me. And he/she was like really stressing to my mom that I need to be more active. So my mom kind of encouraged me to be more active.* (Sally, p.13)

As with informational support regarding physical activity, more women with excessive weight gain received encouragement to be active ($n = 7$) compared to those with normal weight gain ($n = 3$). The reason is likely the same as that discussed in relation to informational support. Others may have felt more of a need to encourage women with excessive weight gain to be active because of noticeably high weight gain or low activity level, or because it was the women's first pregnancy.

The encouragement women received regarding physical activity during pregnancy was not all supportive of activity. Three women with normal weight gain and two with excessive weight gain were advised by others to get a lot of rest during pregnancy. However, none of these women agreed that a lot of rest is required in pregnancy. Julie (N) said her mother-in-law told her to rest all the time. She felt that the traditional Native belief that women need a lot of rest when they are pregnant prevents women from getting physical activity:

*My mother-in-law, they follow the real traditional ways of the Native beliefs. And she always told me you need a lot of rest, you need to rest all the time. But I knew if I laid around all the time I'd probably end up you know gaining lots of weight and I wouldn't be able to go through the whole process of labour, it would make labour and delivery more difficult. So I tried to do, you* ***do*** *need to rest but you also need to balance that out with exercise. . . . But I think for other people it's getting them out of that old way of thinking where they think they just have to sleep and rest all the time. I think a big thing's education.* (Julie, p.9)

Gray-Donald et al. (2000) reported that Aboriginal women in James Bay, Quebec viewed physical activity during pregnancy as undesirable. This is similar to the advice women received to rest all the time during pregnancy. However, contrary to Gray-Donald's finding that physical activity is undesirable, all women in the present study believed that physical activity is beneficial to pregnancy and none of the women who received advice to rest a lot believed the advice.

*Summary.* All women with excessive prenatal weight gain received encouragement from others to eat healthy and be active during pregnancy. In contrast, about half of the women with normal weight gain received similar advice. Some women were also told to rest a lot during pregnancy; however none of the women believed that this was true. So far, the advice (information and encouragement) from others relating to prenatal weight gain has been discussed. The following section reveals women's response to the advice which is important in understanding the contribution of advice to women's health behaviours and prenatal weight gain.

*Response to Advice from Others*

Women responded differently to others' information and encouragement to eat healthy and get physical activity. Some women responded positively and acted upon the advice received; however, others' health behaviours did not appear to be influenced by the advice. Women's response to information provided by health professionals specifically will be discussed separately.

*Healthy eating.* Three women with normal gain and one with excessive gain said they ate healthier as a result of receiving advice to eat healthy. Alex (N) said she tried to follow the advice that people were telling her: "*It didn't really bother me them telling me what to eat. I was just kinda, I was looking for ways to get over the diabetes so that I could, so what everybody told me I should be eating is what I tried to follow*" (Alex, p.20). Anna (N) said, "*I probably ate more healthy food than I did for the junk food*" (Anna, p.14) because of her mother's advice.

In contrast, five women with excessive gain and one with normal gain said their eating was not affected by the advice they received. When asked how having people tell her to eat healthier affected her eating, Val (E) said:

> *I found it didn't really affect me cause I didn't really listen to them. It went in one ear and out the other basically. (laughs) Especially if you're pregnant you can't really take- I don't know, I just didn't want to hear them. Don't really want to have anyone to tell me what to do.* (Val, p.20)

Debbie (E) described how her eating was not affected by others' advice: "*I don't really think it [others' advice] affected anything because my eating was the same. Like cause, like I said before, that if I ate junk food or fast food I'd compensate with healthy,*

*like fruits and vegetables. And I had always kinda been that way*" (Debbie, p.13). Kate (E) explained how others' advice did not affect her eating:

> *Well it didn't really affect it cause I still ate the way I wanted to whether they liked it or not so. They didn't really, I didn't really listen to them there. . . . Just cause sometimes I just choose to do what I wanna do and not listen to anybody at all, so sometimes I just do what I wanna do.* (Kate, p.22-23)

The literature suggests that information is not sufficient to change eating behaviour (Anderson et al., 1995). It has been demonstrated that nutrition advice is able to change pregnant women's knowledge about nutrition but not impact women's attitudes or actual dietary intakes (Anderson et al.). This is consistent with the present study in that women received advice from others about eating but for some, it did not change their efforts to follow a healthy diet. The advice being given in the study, however, was given through an intervention as opposed to advice from family and friends as well as health professionals as was the case in the present study. The fact that women's eating did not change despite information and encouragement to eat healthy suggests that advice is insufficient to promote behaviour change and that women have other forces contributing to their eating. Other social influences as well as economic and physical environmental influences on eating will be discussed in later sections.

*Physical activity.* Women with excessive weight gain responded more positively to advice about physical activity than they did to advice about eating. In other words, the advice to be active seemed to be more effective than that for eating healthy among women with excessive gain. Equal numbers of women with normal weight gain responded positively to advice about eating and physical activity.

Most women responded positively to others' advice to be physically active. Five women with excessive gain and three with normal gain said others' advice made them want to be more active or resulted in increased activity. Sally (N) said that having her doctor and the nurses encourage her to be active "*made me wanna do more, activity and more like physical activity*" (Sally, p.13). Ruth (E) said:

> *Well I did work out before, like I just wasn't in shape but I did make an effort to work out everyday. But I just tried a little harder because my mom and the nurses said that if you you know exercise the birthing's going to be a lot easier. So it just made me, I didn't want a hard, hard labour.* (Ruth, p.10)

Val (E) explained why she started to get physical activity partway through her pregnancy:

> *Well just other people telling me "walk because your labour pains are gonna be tough and you need all your strength in your lower legs." Just other people telling me, you know that had kids, what they went through and all that. Cause they were just telling me just to keep walking. So I just went to their advice. Cause they noticed I was getting bigger and they told me just to keep walking and walk and walk. Ok, I'll have to force myself (laughs).* (Val, p.18)

Part of the reason that advice to be physically active was effective was related to the fact that women feared a difficult labour and several were told by others that physical activity would help ease labour. Another reason for the positive response to others' advice was because women trusted those providing the advice or learned from others' experiences. Debbie (E) listened to others' advice about physical activity because she trusted their advice: "*What made me think is that these are people that had been through it and they know what they're talking about so I should do it [activity]*" (Debbie, p.13).

She thought that if others were not encouraging her, she would not have bothered to get physical activity: "*Like if nobody told me that it's good for me then I don't think I would've bothered with it*" (Debbie, p.13).

Kate (E) mentioned listening to others because of their experience. When asked about the impact of others' advice on her activity, she said:

> *Well it kinda made me wanna do it more hey. Like cause like, cause of their past, like I've seen them so, it just kinda made me wanna do more instead of just being like just sitting around and stuff. . . . Cause they have kids themselves and you know, they're kinda big and you know like they always say like "this is what happens if you don't walk."* (Kate, p.22)

Sara (E) was the only woman who had a negative response to others' advice to be active. When discussing her doctor's advice to walk everyday, she said, "*I trust him/her, what he/she was telling me but I just didn't listen*" (Sara, p.7). She also said she did not like it when people always told her to get physical activity: "*I just didn't like that they were always telling me always go for walks, exercise. And I didn't like that they were always telling me that. . . . They're always telling me the same words*" (Sara, pp.10-11). Her level of activity did not seem to increase as a result of others' encouragement.

In summary, most women responded positively to others' advice to be physically active, and were more active as a result of the advice. However, women with excessive weight gain responded less positively to advice to eat healthy. Many women said their eating did not change as a result of other's advice and encouragement. In fact only one woman with excessive weight gain said her eating changed because of others' advice. These findings demonstrate that others' advice can influence women's beliefs,

motivation, and health behaviours; however, advice may not be sufficient to promote health behaviours, particularly healthy eating. Other social, economic and physical environmental factors that impacted women's health behaviours will be discussed in later sections.

*Response to advice from health professionals.* There were variable responses to advice received from health professionals. Two women with excessive weight gain and one with normal gain found the information they received from health professionals to be useful. Alex (N) discussed what she thought about the meal plan she received for her diabetes: "*I found it was pretty good. They gave charts and how many servings I should have and stuff like that. So what they gave me was, it worked really good for me I still use them, a lot of them to plan meals and stuff*" (Alex, p.9). Greta (E) said the information she received from health professionals about eating and physical activity "*really helped me*" (Greta, p.11). Ruth (E) completely changed her eating habits during pregnancy and said it was because of the advice she received from the dietitians as well as her sisters:

> *Just the advice from dietitians and my two sisters got gestational diabetes and I didn't want to get that so I totally switched my eating habits. . . . Like I'm not one for fruits and vegetables and stuff but I made sure I ate fruits and vegetables and like whole wheat bread and you know like they tell you to.* (Ruth, p.3-4)

Sally (N) followed the advice she received from health professionals about physical activity. When asked what helped her to get physical activity, she said:

> *Probably because I figured what Dr. [name] told me that was my doctor, like to not gain, well he/she didn't say exactly not to gain too much weight, but because*

*of what happened in my first pregnancy so he/she told me to be a little bit be careful and to be more active. And so I figured well I would do that.* (Sally, p.12)

In contrast, four women with excessive weight gain and two with normal gain mentioned that they did not use or understand the information they received from health professionals relating to weight gain. Kate (E) said:

> *There's like a bunch of like, we got pamphlets when we were at the prenatal classes hey. And like they like told us like what is it, post, not post, is it prenatal exercise or something like that? But I never bothered to do that. And then like I didn't read the papers or anything.* (Kate, p.6)

Olivia (E) said she did not follow the *Canada's Food Guide to Healthy Eating* (Health Canada, 1992) that she was given: "*Well like I didn't really use it like I kinda tried to get as much healthier foods in my diet like the dairies, you know breads and cereals, fruits and vegetables. Like I was already pretty much into that. . . . . No, I didn't really go by it. I just thought that I was doing ok*" (Olivia, p.11).

One woman in each group said she did not implement the information received in prenatal class because it was too late. Debbie (E) said she did not follow the advice she received about not eating for two because she was already eight months pregnant and felt it was too late to change her diet. After learning that she did not need to eat for two, she said: "*It was a bit too late for my eating to change. (laughs) Cause I didn't go until my eighth month and so it was too late to change it*" (Debbie, p.17). Fay (N) said the following about the information she received at prenatal class: "*To me it was kind of a little too late because I was already, like there was just two months left in my pregnancy. So after that I you know, I tried to eat what I could*" (Fay, p.7).

In summary, women had variable responses to advice from health professionals. Two times more women did not find the advice received from health professionals to be helpful compared to those who found it useful.

*Summary*

Advice was composed of the information and encouragement received from others relating to prenatal weight gain. It was evident that many women, and particularly women with excessive weight gain, received advice from others about eating and physical activity. However, other's advice did not always result in positive changes in health behaviours. For instance, several women with excessive weight gain responded negatively to advice to eat healthy. Few women received information from health professionals about weight gain.

One of the proposed means by which support influences health is through influencing thoughts, feelings, and behaviours in ways that promote health (Callaghan & Morrissey, 1993; House et al., 1988), which may occur through the provision of advice. The literature suggests that social support does in fact promote health behaviours (Schaffer & Lia-Hoagberg, 1997; Walker et al., 1999). However, although informational support and encouragement are components of the women's social environment, there are other components that may promote health behaviours. For instance, social support also involves tangible support (Callaghan & Morrissey), or support for action which is discussed in the following section.

### *Support for Action*

In addition to informational support, the social environment consists of support for action which was an evident theme in the interview data. Support for action refers to instrumental or tangible aid from others that helped women to achieve health behaviours and healthy weight gain. Specifically, support for healthy eating and physical activity will be discussed. The instrumental support women received for eating healthy and being active was an important influence on these health behaviours. In addition to receiving positive support for action, women also experienced either negative instrumental support or a lack of support for health behaviours. Differences existed in the support for action received by women with excessive and normal weight gain.

#### *Support for Healthy Eating*

Some women had positive instrumental support for healthy eating, including four women with normal weight gain and three with excessive gain. Two women with normal gain and one with excessive gain said others monitored their eating which helped them to eat healthy. For instance, Val (E) said that her coworkers and relatives were "*keeping an eye on me when I eat*" (Val, p.6). Julie (N) referred to her husband as being "*health conscious*" (Julie, p.13) and said he kept an eye on her eating:

> *Especially when I was pregnant, he really kept an eye on what I ate so I was kind of leery about going astray you know too far. Especially, sometimes you have those cravings and you just can't get rid of them so he'd be good about letting me have a treat but he'd also be encouraging me to eat more yogurt or more fruit or more of the healthier foods than the junk food.* (Julie, p.14)

Two women from each group mentioned how their family members influenced them to eat healthy through their grocery purchases or cooking. For instance, Debbie (E) explained how her mother provided healthy foods for her:

> *With my mom she tried to incorporate a lot of healthy stuff like salads. And when she was around if I wanted to have a snack it would have to be a fruit or a vegetable. Like she always made up vegetables trays. And I tried my best to, like if I was at home, instead of reaching for a bag of chips I tried to make vegetable trays and fruit trays so that they'd be more convenient and handy, you don't have to start making them.* (Debbie, p.12)

Olivia (E) said her mother helped her to eat healthy because of the types of foods she bought: "*My mom would buy like the groceries and she'll buy like healthy foods for me and we rarely have junk food here*" (Olivia, p.16). Anna's (N) mother helped her to eat healthy by cooking and making suggestions of healthy foods to buy when they went grocery shopping together: "*She made meals with me or she would cook for me. Or when I went grocery shopping she would come with me and help me buy what she thought was good for me. . . . We bought like just fruits and vegetables and cheese, yogurt, rice*" (Anna, p.9-10).

Olivia (E) was the only woman to mention having positive role models that influenced her eating. She saw how her sister and friends ate healthy and took care of themselves during their pregnancies, and she wanted to do the same. It should be noted that other women were not asked specifically about role models. The following excerpts illustrate how Olivia's sister and friends influenced her eating:

*Having watched my sister you know when she was pregnant and just how she kinda took care of herself, the way she ate and how. And like having friends like you know while they're pregnant and how they took care of themselves. I just kind of used all those kinda while I was pregnant. So it wasn't really during, while I was pregnant but just you know knowing the stuff before I was pregnant.* (Olivia, p.9)

*Having that my sister lost like you know, pretty much most of her weight after she was pregnant. She, I just, that kind of influenced me to not eat too unhealthy while I was pregnant so that I could you know lose most of that weight after I had my baby. . . . She lost, I don't know, she just felt good after she had her baby and I wanted to feel good after I had my baby. . . . She just like how she ate or what she- oh like how she was like, just her physical activity. She was just like she. Just she ate healthy and I wanted to eat healthy too. . . . Like she's not really into like the fast food. She's like into healthy home cooked meals. So I didn't really like to eat out or eat anything greasy or unhealthy.* (Olivia, pp.9-10).

The fact that Olivia had positive role models but still gained excessive weight during pregnancy illustrates the fact that there are multiple influences on weight gain. For instance, Olivia did not feel she had instrumental support for physical activity as will be discussed in the following section.

*Negative support for healthy eating.* A number of women had family and friends whose actions were incongruent, and often in direct opposition, with the advice women received about healthy eating. Although all seven women with excessive weight gain and four with normal gain received advice to eat healthy during pregnancy, five women with

excessive gain and one with normal gain discussed how others' eating negatively affected their efforts to follow a healthy diet. Thus, most women with excessive weight gain ($n$ = 5) reported having negative social influences impacting their ability to eat a healthy diet.

Ruth (E) described her experience with trying to eat healthy: "*It was extremely hard. What made it hard is like come Easter everybody's digging into the treats and I, you know I'd steal a treat or two but I would keep it in moderation. My family loves to eat, his family loves to eat so when we get together all it is is eating*" (Ruth, p.10). Ruth also explained that it was hard for her to eat healthy food when surrounding people were eating less healthy foods like chocolate or fatty foods: "*So it's kinda hard to . . . sit there and eat carrots when everyone else gets to eat whatever (laughs) they want*" (Ruth, p.6). She also described her husband's influence on her fast food intake:

> *Weekends are really bad cause [husband], he didn't have to go to work and he likes his junk food, man food (laughs). So I'd ask him what he wants for supper and he would want you know like a hamburger or fries or something so then we'd go get hamburger and fries.* (Ruth, p.12)

Kate (E) explained how other people made it hard for her to eat healthy:

> *What made it harder? Just being around the food that you can eat. . . . Just like junk, like chips, candy bars, everything else like that. . . . Like cause you know where you go, like places you go visit and there's people there, they're eating, like you know having snacks and stuff. Then they ask you, and it's just like alright. That's what made it hard.* (Kate, p.20)

Anna (N) also explained why it was difficult for her to eat healthy: "*My family, they really like to eat a variety of junk foods, they're junk food eaters and it made it hard on myself*" (Anna, p.15).

Carrie (N) and Julie (N) discussed how others pushed them to eat more food. They both described being frustrated with this because both were trying to control their eating. Carrie said "*It seems like they're supporting me to be big*" (Carrie, p.21). She said: "*Some of my sisters, when I was pregnant they, when I'd just eat a little, they always say 'Oh, you're eating for two have some more, there's more there.' Like I'm trying to not like eat that much. They just like tell me 'Eat some more*" (Carrie, p.22). Julie also described her experience with others pushing food on her:

> *I felt myself that I was doing a good job so it bothered me when people would tell me "Eat some more, you're eating for two." But I felt like I was already doing well enough that I didn't need to. It just kind of annoyed me, like you know, this is my body, this is how I'm doing things. And sometimes they'd even bring me extra, like if we went out to a family member's to eat they'd be pushing extra foods on me and it would be like "No, I'm full thank you." It just maybe kinda goes along with I don't like being told what to do (laughs) I don't know, but I just felt already felt like I was doing a good job and I didn't need to listen to them.* (Julie, pp.14-15)

It is interesting that the two women who described others pushing food on them had normal weight gain. The reason none of the women with excessive weight gain mentioned how others pushed food may be because they did not view it as a problem.

Most of the women with excessive weight gain believed they needed to eat for two during pregnancy as was discussed in *Beliefs about Eating*.

In summary, there was a distinct difference in the number of women with excessive and normal weight gain who had negative social influences on their eating in terms of others' eating. Most women with excessive weight gain ($n = 5$) were negatively influenced by others' eating compared to only one woman with normal weight gain. Similar numbers of women in each group had positive instrumental support for eating.

*Support for Physical Activity*

There were two main ways that others provided women with instrumental support for physical activity including being companions for physical activity and helping motivate women to be active. All six women with normal weight gain mentioned having a companion for physical activity. Five of these women mentioned how having a companion made it easier to get activity or helped them to get more activity. Carrie (N) described the support she received from her husband for physical activity:

> *Just my husband like he comes and he helps me go for walks or do a little bit of exercise. . . . Like he comes with me. He talks to me. We just like talk about I don't know. It like makes me keep going instead of like "Let's turn back I'm tired" or something. Ya cause sometimes I like listening to his stories and he wants me to keep moving.* (Carrie, pp.21-22)

Julie (N) had coworkers to walk with: "*When I was still at work, the girls at lunchtime always go for a walk so I'd just go with them*" (Julie, p.13). She said the following about having people to walk with: "*It's no fun walking alone. . . . But if*

*somebody's there and they're kinda helping you with this, they kinda say like 'let's go for a walk*" (Julie, p.17). When asked what helped her to get physical activity, Anna (N) said, "*Probably mainly just like family coming with me for walks*" (Anna, p.13). Alex (N) had her children and her sister to walk with and she said: "*Whoever was around I'd just take them with me*" (Alex, p.4). Having her sister as an exercise companion helped Alex to get motivated: "*She got me out there and got me motivated and then once I got the energy flow going then it was easier*" (Alex, p.17).

Sally (N) and Anna (N) both mentioned how their children helped them to be more active. Sally said getting activity was easy for her "*because I had people come with me and I don't know, just being with my son I guess, it was easy because he is a very active person*" (Sally, p.4). When she was feeling tired or lazy, her son would help her to get out and be active: "*My son cause he's really active and my nieces are always around and I always bring them to the park or else I'll go for walks with him. I walk with my son while he's riding his bike*" (Sally, p.12).

Three women with normal weight gain mentioned having someone to support or motivate them to be active, and discussed how beneficial it was. Having someone to help motivate women to be active was viewed as distinct from having someone to encourage them to be active as was discussed in *Advice about Physical Activity*. It was felt that having someone motivating women was more supportive of action than being encouraged, or told to be active. Sally (N) said:

> *I had all that motivation and then my sisters are really, really active during summer, and then my nieces. So I think that's kind of, like it's true that to have motivation and somebody to encourage you and to be supportive and I just think*

*that people, well pregnant people should have more of that, like motivation, somebody to motivate them and to encourage and support.* (Sally, p.3)

*Lack of support for physical activity.* The social environment provided inconsistent support relating to physical activity for women with excessive weight gain. Although all women with excessive weight gain received advice to be physically active, only one woman reported having someone to actually motivate her and help her to be active, and one woman reported having a companion for physical activity. In contrast, three women with normal gain had someone to help motivate them, and six had companions for physical activity. Thus, most women with excessive weight gain did not have the same companionship for physical activity as those with normal gain. The lack of an exercise partner has been reported in the literature as a barrier to physical activity (Eyler et al., 2002).

Kate (E) was the only woman with excessive weight gain who reported having a companion for physical activity. She thought having a friend to walk with helped her to get physical activity.

*I was always walking hey like me and my friend we'd walk to the end of the road and go back or we'd walk all the way to the other end of the road and come back and then go back. So I pretty much just did a lot of walking.* (Kate, p.5)

Debbie was the only woman with excessive weight gain who reported having people to support or motivate her to be active, and she thought her activity increased as a result. She said, "*I find that when you do have someone there to motivate you it does work. Like with me, I had my mother there*" (Debbie, p.15).

Three women in each group who did not have someone to help motivate them to be active discussed how they thought this would have helped to increase their level of activity. For instance, Olivia (E) did not have anyone to help motivate her. When asked what would have helped her to walk more during her pregnancy, she said: "*Like I'm pretty much alone out here, I was pretty much alone here but if I had somebody that was with me and you know, motivated me to do more walking*" (Olivia, p.6). Ruth (E) also did not have anyone to motivate her and said she needed motivation from others to help her be active:

> *Like my husband isn't active so it's kinda hard I tried to get him out there with me but. I think if you don't have a good support then it's tough to get yourself motivated. . . . For me like I don't know I need someone there to (slaps hand) slap my hand or slap my butt to get going or you know just get support from your spouse or from your family to help you get out there and make sure you get out there. (I: ok) Cause I'm one that needs you know (laughs) put on the right track every once in awhile so.* (Ruth, p.6)

In summary, there was a distinct difference between women with excessive and normal weight gain in terms of their support, or lack of support for physical activity. More women with normal weight gain had companions for physical activity and had someone to help motivate them to be active. Few women with excessive weight gain had such support for action. Women described the positive influence that instrumental support for physical activity had on their activity level.

*Summary*

It is evident that women with excessive weight gain received less support for action from others for healthy eating and physical activity. In fact, women with excessive gain had inconsistent support for health behaviours. Although they were being told by others to eat a healthy diet, others were negatively influencing their attempts to do so by eating unhealthy foods in front of them. Women with excessive gain were also being told to get physical activity, but only one of them had someone to help motivate her, and one had a companion to be active with.

In contrast, more women with normal weight gain had support for action through companions for physical activity and someone to help motivate them. They were also less likely to have negative influences on their efforts to eat healthy. It has been theorized that one way in which social support influences health is by facilitating behaviours such as eating and physical activity which promote health (Callaghan & Morrissey, 1993; Umberson, 1987). It appears that women with normal weight gain had more social facilitators and fewer barriers to healthy eating and physical activity when considering support for action.

*Feedback*

Another theme that emerged from the interview data was feedback about weight gain. Women received variable feedback from health professionals and others about their weight gain. Some women lacked feedback or received inappropriate feedback. The implications of feedback from others on body image will be discussed.

*Feedback from Health Professionals*

All women reported that their weight was monitored by health professionals including their doctor and the community health nurses. Only one woman with normal weight gain monitored her own weight occasionally because she had access to a scale at her mother's home. Similar numbers of women with normal and excessive weight gain received feedback from health professionals about their weight gain. However, as will be discussed, most women with exeessive weight gain received inappropriate feedback. It should be noted that these were the women's perceptions of the feedback they received about their weight gain, which may be different than the actual feedback provided by health professionals. Regardless, women's perceptions of the feedback they received are extremely relevant in understanding prenatal weight gain and women's beliefs about their personal weight gain.

All but one woman with normal weight gain received feedback about their weight gain from their doctor or the health nurses ($n = 5$). Anna said "*They [doctors] would just told me that that's about the average weight that I should be gaining at that time*" (Anna, p.12). Julie reported that her doctor and the health nurses said: "*that I was doing well, like I wasn't gaining too much*" (Julie, p.11). All five women with normal weight gain who received feedback about their weight gain were told that their weight gain was good. This is appropriate considering they gained a healthy amount of weight.

Despite their excessive weight gain, women in this group either received no feedback ($n = 2$) or inappropriate feedback ($n = 5$) about their weight gain from health professionals. Neither Val (E) nor Debbie (E) received feedback about their weight gain despite being weighed by their doctors. Debbie, who had the highest weight gain (34.1

kg), reported that her doctor did not seem concerned about her weight. She said that even though she knew herself that she was gaining too much weight, her doctor never told her this was the case: "*My doctor didn't seem really concerned with it [weight gain]. And they thought it was the baby. But they never actually told me 'You're gaining too much' and so. For myself, I knew that what I was gaining was a bit much*" (Debbie, p.10). Val also said her doctor did not mention anything about her weight gain: "*I had to see the doctor every month for my blood pressure cause it kept going up. But not really anything with weight. They would weigh me but they really didn't say much about how much I'm gaining*" (Val, p.15).

Five women with excessive weight gain were told by health professionals that their weight gain was good. This was inappropriate advice considering they all gained excessive prenatal weight. Four of these women received this feedback from their doctor, and two from a health nurse. Sara (E), who had the second highest weight gain (29.1 kg) said she was told by her doctor that her weight gain was normal: "*He/She [doctor] said it was normal, it was ok*" (Sara, p.15). Kate said the following about her doctor's feedback:

> *He/She said my weight was really good, for like the times like I'd go into see him/her, like every other month I'd go in to see him/her, sometimes every month for a checkup and he/she'd say that like my weight was good, it wasn't over, it wasn't under, it was just like where it should be. So he/she said it was pretty good. I wasn't overweight. Whatever I was doing, I was doing it right.* (Kate, p.19)

Only Ruth (E) was told by her physician that her weight gain was too high:

*He/She [doctor] would say "Oh, you're gaining too much" or "You gained a lot since I've seen you." Or he/she'd let me know that I was, there was periods that I wouldn't gain so much and there was times where I'd just gain a bunch.* (Ruth, p.8)

However, Ruth also received feedback from the health nurses that her weight gain was good: "*Like he/she'd [health nurse] say 'Oh, that's you know, you didn't gain too much' or 'You've only gained a pound' or whatever. But the doctor is the one who said 'Oh, you gained 10 pounds' or you know in two weeks or a month or whatever*" (Ruth, p.8). Ruth described her response to her doctor's feedback that her weight gain was high: "*It knocked me down cause I was getting out there everyday and then when I'd hear him/her say 'Oh well you gained this much' it just kinda, so then I would walk harder. It made me work a little harder*" (Ruth, p.9). Thus, her doctor's feedback that she was gaining too much weight motivated her to get more physical activity.

Clearly, the perceived inappropriate or lack of feedback from health professionals had implications for women's beliefs about their weight gain and their ensuing action to control it. In other words, with no feedback or positive feedback, six women with excessive weight gain had no reason to try and control their gain from a medical perspective. The positive or lack of feedback affected these women's beliefs about the appropriateness of their weight gain. Four of the women with excessive weight gain believed their weight gain was healthy. Ruth's increase in physical activity in response to her doctor's feedback that she was gaining too much weight suggests the potential impact feedback from health care workers may have on women's activity.

Studies were not found that reported on the implications of physician's feedback about women's weight gain. However, as previously discussed, research has indicated that women are more likely to gain weight within the recommended ranges if their physicians instruct them to do so (Cogswell et al., 1999; Taffel et al., 1993).

*Feedback from Others*

Most women did not receive feedback about their weight gain from family or friends (4 women with normal weight gain and 5 with excessive weight gain). Only one woman with excessive weight gain was told by others that she was gaining too much weight: "*Well they [coworkers] were telling me I was getting too big. From eating too much, stuff like that*" (Val, p.8). She interpreted their comments as harassment: "*Just mainly my coworkers that really* ***harassed*** *me about my weight* (laughs)" (Val, p.8). Ruth was the only other woman with excessive weight gain to receive feedback from others about weight gain. Her family told her she was doing well with her weight gain: "*And then my family said I was doing good*" (Ruth, p.5).

Anna, who gained normal weight, received feedback that she was gaining too much weight too quickly. She was told by others: "*Oh you're starting to show. You're getting big. You're gaining too much weight too fast*" (Anna, p.1). Carrie, who also had normal weight gain, was the only other woman to receive feedback about her weight gain. People were telling her she was too big: "*People were saying I was fat, that (laughs) I was really young and I was too fat*" (Carrie, p.1). However, her cousins and sisters were telling her it was ok to be big: "*Some people are just like, they just, it's, I don't know like it's ok to gain weight because you already have two kids or three kids*"

(Carrie, p.9). It is interesting that two women with normal prenatal weight gain received comments that they were gaining too much weight. This may have influenced their awareness of their weight gain and their efforts to control it, thus contributing to their healthy weight gain.

*Impact of Feedback on Body Image*

Feedback about weight gain both negatively and positively influenced women's feelings about their bodies and about gaining weight. For Carrie (N) and Anna (N), the feedback they received about their weight gain had a negative impact on their feelings about their bodies or gaining weight. They both expressed negative feelings towards their bodies and discussed how others' comments influenced these feelings.

Anna (N) did not feel comfortable with her body. She felt depressed and did not want to do anything or go anywhere because she felt like everyone was staring at her and thinking she was fat. She felt this way because of comments she received from others about her weight gain:

> *I felt like everybody was staring at me thinking that I was fat. (laughs). . . There was times I got depressed about it. And there was times that I didn't want to go nowhere I just wanted to stay home. . . . Just basically like I was depressed. Didn't want to do nothing. . . . I think what made me feel like this was people telling me "Oh you're starting to show. You're getting big. You're gaining too much weight too fast." And they would say you know "You should get bigger clothes."* (Anna, p.1)

Carrie (N) did not like getting bigger during pregnancy: "*I felt really ugly, cause I*

*was getting bigger. And fat. Cause I'm used to being really small. . . . I didn't really like it*" (Carrie, p.1). She explained that the reason she did not like getting bigger was because of others saying she was too fat. Her response to their comments was as follows: "*When people started talking more I just wanted to get rid of it [her weight]*" (Carrie, p.1). Thus, feedback about weight gain from others including health professionals has the potential to negatively influence women's feelings towards their bodies and reinforce negative body image feelings. As discussed in *Personal Factors*, almost all women had negative feelings about their bodies and about gaining weight.

In contrast, Julie (N) and Fay (N) felt more positively about gaining weight because of positive feedback they received from others about their weight gain. Julie said her husband was supportive when she was feeling self conscious about her weight:

> *At first I was ok but then when I started to show I was starting to feel really self conscious about my weight cause I was already quite heavy to begin with. And the last thing I wanted was to be really heavy, to you know gain weight. But my partner was understanding like he, like I'd say "Oh I look so big and fat" (laughs) he'd say "But you're pregnant, it's ok."* (Julie, p.1)

Julie also said, "*And he [husband] did tell me that I looked really good all the time too so that kinda made me feel better about gaining weight*" (Julie, p.18). Fay (N) felt better when her doctor told her she had not gained more than recommended: "*Well after I found out about that, cause the doctor talked to me, knowing that what he/she told me, like the most weight I should've gained like I wasn't at yet and so you know I wasn't overweight is what he/she said and I felt like, I felt better about that. It made me feel a lot better*" (Fay, p.12).

*Summary*

All women reported that their weight was monitored throughout their pregnancies. However, few women received feedback about their weight gain from health professionals and some women with excessive gain reported being told that their weight gain was good. In fact, six of the seven women with excessive weight gain received no feedback or inappropriate feedback from health professionals about their weight gain. Few women received feedback from family and friends about their weight gain. Feedback about weight gain is related to women's beliefs about the appropriateness of their weight gain, and in turn their desire, motivation, and efforts to control it. Comments about weight gain both positively and negatively influenced women's feelings about their bodies or about gaining weight.

### *Influence of the Social Environment on Stress*

The women's social environments influenced their level of stress during pregnancy both positively and negatively. All of the women with the exception of one woman with normal weight gain mentioned having stress in their lives during pregnancy. As discussed in *Personal Factors*, women's stress level has implications for eating, physical activity, and in turn weight gain. Some of the influences on women's stress levels have been previously discussed. This section focuses on the various social influences on women's stress levels including work and other people. The social environment created stress in women's lives but also helped alleviate stress.

Work was mentioned as a contributor to stress by three women who gained excessive weight and two women who gained normal weight. Julie (N) said, "*There was*

*some major stress going on with work*" (Julie, p.5). Alex (N) said her stress was "*from here [work], this place has a high stress job. I was training people here to take over my job. Not knowing if I was gonna have a job when I came back*" (Alex, p. 8). Val (E) also described work as her main stressor:

> *It was just mainly at work. . . . I think what mainly stressed me out was my working. But other than that at home it was quiet, nothing really. Just at work. (Interviewer: Ok) I think it was my job that would bring my blood pressure up too.* (Val, p.6)

Five women who had excessive weight gain and three women with normal gain mentioned that other people contributed to their stress. Three women with excessive gain and two women with normal gain specifically mentioned the baby's father as a contributor to their stress level. Alex (N) said, "*My baby's dad put a lot of stress on me*" (Alex, p.8). Greta (E) described her experience of stress during pregnancy as follows:

> *Well there was drinking going around. My husband was, what do you call, like you know cheating, cheating on you. Ya that's why I was going through all this. (I: Oh) Ya so that's why I was going through a lot of stress. Well to this day, I like to this day, I still go through stress but like he's promised me he's never gonna do that to me again so. And we have four kids and I have that little trust in him but not like as much as before. And he's how do you say, we'll just say he's emotional, emotional abuse. Taking control of you, like just ordering you around like ya but it's not. We'll say is it mental abuse like? . . . Ya he's like demanding everyday. That's another thing why I get stressed out and tired.* (Greta, p.6)

For Debbie and Kate, who both had excessive weight gain, the baby's father being

absent contributed to their stress. Debbie (E) said, "*I'd have to say most of the stress came from the father not being around, the guy I got pregnant with*" (Debbie, p. 5). Kate (E) described how the absence of the baby's father influenced her stress:

> *Well for stress, the only, the one thing that really stressed me out a lot was like his dad not being there. Like he never came around he just, and he still hasn't came around so. Like now I'm trying to cope with it but then like there's just this other part of me saying like he's the father he has to be here you know. . . . And then he tells me that like "Well are you sure it's mine?" You know, how could it not be you know. So that's just things I used to get stressed out over.* (Kate, p.10)

Although women's social environments contributed to their stress levels, three women with excessive weight gain mentioned how support can help alleviate stress. Ruth (E) said she needed support in order to deal with the stresses at work: "*Well dealing with the stress I went through at work I felt like I needed support you know to go to work everyday regardless of all the stuff I went through*" (Ruth, p.8). Kate (E) said, "*Well, [friend] she, like she really talked to me. Like I told her how I felt a lot of times and she'd like talk me out of it. Talk me into being normal, like feeling normal again hey like not stressed out*" (Kate, p.11).

Fay (N) did not have anyone to talk to but thought it would have helped her stress if she did: "*I think if I had told people, the father I mean. If I just told them like it would've helped you know like relieve the stress. You know just someone being there. Like they were there but it's just that I didn't tell them you know what was bothering me*" (Fay, p.11).

Women's experiences of social support helping to alleviate stress are consistent with the literature which has established a link between social support and stress in general and in relation to prenatal outcomes (Callaghan & Morrissey, 1993; Hoffman & Hatch, 1996; Thoits, 1986). In general, social support is thought to been protective during stressful events (Thoits; Callaghan & Morrissey). Similarly, in pregnancy, it is thought that social support acts as a buffer for stress which in turn results in good pregnancy outcomes (Hoffman & Hatch).

### *Summary*

The social environment both facilitated and inhibited healthy eating, physical activity, and healthy weight gain. The social environment impacted women's prenatal weight gain through advice (information and encouragement), support for action, and feedback about weight gain. Differences existed in the social environments of women with normal and excessive weight gain. Although more women with excessive weight gain were provided with information and encouragement to be active and eat healthy, they were more likely to have negative or a lack of support for action. In contrast, women with normal weight gain had support for being active, such as a companion for physical activity, and few reported negative social influences on their eating. Women with excessive weight gain also reportedly received inappropriate or a lack of feedback about their weight gain from health professionals. Women's social environments clearly influenced their health behaviours and prenatal weight gain.

## The Economic and Physical Environment

In addition to personal factors and the social environment, the economic and physical environment had implications for prenatal weight gain. The components of the environment that were found to be important include income and access.

### *Income*

Women's income influenced their ability to follow a healthy diet and participate in physical activity. Equal numbers of women with excessive and normal weight gain ($n$ = 3 each) reported having a family income below the poverty line (National Council of Welfare, 2002). Thus, the groups were similar in terms of income status.

#### *Income Affects Healthy Eating*

In Egger and Swinburn's (1997) ecological model of the influences on obesity, both family income and food prices are components of the economic environment which influences food intake. In the present study, income and the cost of food were identified by the women as barriers to healthy eating. The majority of women with normal ($n$ = 5) and excessive ($n$ = 6) prenatal weight gain discussed the impact of income on one's ability to eat a healthy diet. Out of these women, three with excessive weight gain and two with normal gain personally experienced financial constraints which affected their eating and ability to afford healthy foods. Carrie's (N) experience illustrates how income can impact eating:

> *What made it hard? Like just didn't have, like always have the money to have a healthy diet. . . . Just like when it comes to eating it's just like you can buy*

*whatever you want to buy, whatever you want to eat. Like it's there for you. But like if you have other things to pay you can't really buy what you can buy. It kinda goes to my kids mostly. . . . I don't think we really bought fruits. But just like once in awhile we'll buy fruit. Something that will last for, 'til we get our next pay cheque. (laughs) . . . Like potatoes, macaroni, like meat stuff, canned stuff, all that. . . . Probably the milk products. Cause we really, like my son really drinks a lot of milk and it only lasts like two days. And like we had to, we'd buy two jugs but it won't last us like for long, it would just last us for like the week or few days. Ya I think that was the other thing.* (Carrie, p.18)

Olivia (E) said that sometimes the foods she could afford were not healthy choices:

*Sometimes I guess I'll just get what I can afford and sometimes they won't be really like healthy foods. Especially some of the meat, like just hamburger. Like a regular, well I'll just give you an example, like some of the meat you get you have to get it cheap and it's not that, there's a lot of fat on it. Like when I was going to school, sometimes I would have, I'll just have to go to like a fast food restaurant to get what I could afford, greasy fast food.* (Olivia, p.19)

Ruth (E) described the affect of her income on her eating: "*Well just not being able to have that extra cash to buy you know, cause produce is expensive now and I don't know, ya just, just didn't have the money to buy enough food for three meals a day plus snacks*" (Ruth, p.13). Even though she could not afford sufficient food, Ruth ate enough because of the support she received from family: "*Like my mom, they helped us out a lot, we'd go down there for dinner or you know, or my sister would have us over. No, we ate*

*pretty good. (I: Ok) Ya, so it was difficult if we didn't have the help, support, people around us, but we did*" (Ruth, p.18).

Three women in each group thought that women's financial situations would affect their diet but did not personally experience financial constraints for eating during their pregnancy. For instance, Julie (N) pointed out that some women may have difficulty affording foods such as fresh fruits and vegetables. She also felt that women with lower income eat more starch, fast food, and greasy food. She said:

> *I think that for me I'm fortunate because I'm working and I have the money to spend on fresh fruits, vegetables and stuff like that and I'm gonna be getting a paycheque in the middle of the month so I can continue to pay, you know buy fresh fruits and vegetables. For those women who aren't fortunate enough to be, to have the income, or to be working, or can't work, it's really hard for them to be able to obtain the fresh fruits and vegetables. And I know when they do spend money on food it's food that will help, will last for the month. . . . And people because of their financial situation tend to eat more starch, fast foods, greasy foods, like they tend to eat more of that. So education and then financial situations too would help. Or to be able to obtain the fresh produce would be good.* (Julie, pp.8-9)

Alex (N) discussed how income limits one's ability to afford healthy foods and eat a healthy diet. She experienced financial constraints herself after she had her baby. When asked what would help women to be able to eat a healthy diet during pregnancy, she said:

*Having lots of money (laughs) is all I can say. And if you don't have the money you can't eat properly. And I found that out after I had the baby and I was on UI [unemployment insurance]. We couldn't afford nothing but our bills.* (Alex, p.10)

Consistent with women's experiences and observations regarding the relationship between income and the ability to eat a healthy diet, Darmon, Ferguson and Briend (2002) demonstrated that constrained food budgets have a direct impact on food choices and in turn diet quality. Drewnowski (2003) described the relationship between low income and eating as follows: "Diets of low income consumers for whom food price is the most important consideration may be high in sugars and fat, simply because these are the cheapest sources of dietary energy available" (p.840). Details of women's dietary intakes were not obtained in the present study; however, about half of the participants ($n$ = 5 with excessive gain and 1 with normal gain) appeared to be consuming relatively high amounts of junk foods, which are typically high in sugar and fat.

Tarasuk and Maclean (1990) found that low-income women's primary concern was having enough to eat and "concerns about the nutritional quality of foods were clearly secondary" (p.80). Healthier foods were considered a "discretionary expense" (Tarasuk & Maclean, p.79), and the quality of food was often compromised because of other demands that took precedence. Foods considered to be of better quality or more nutritious were often not purchased because of a higher priority placed on expenses such as shelter, household goods, clothing, transportation, and entertainment (Tarasuk & Maclean). It was clear in the present study that women had other priorities than purchasing healthy foods. For instance, Carrie (N) described her money going mostly to her kids and bills were a priority for Alex (N). Ruth (E) described the following as

limiting her ability to afford healthy foods: "*And plus having animals, you have to save a budget for them, a budget for you, your vehicle, bills. It was difficult*" (Ruth, p.13).

The fact that all women in the study were advised by others to eat healthy, yet some women could not purchase healthy foods because of financial constraints, creates a situation potentially resulting in feelings of disempowerment, personal failure, guilt, and inadequacy. For instance, Alex (N) felt depressed because she could not purchase healthy foods to feed her family:

> *A lot of the food we were eating was whatever we could afford so like you know if you have the money to buy proper food and healthy food and everything that's healthy is more expensive than anything that's not and so. That's what I find was hard. And then that depresses you when you can't be feeding your family the things you'd like to feed them.* (Alex, p.10)

Alex was well informed about healthy eating, but did not have the means to do so. This example illustrates how victim-blaming, whereby individuals are held responsible for their health regardless of the environmental contexts in which they live, is a potential impact of others' advice to eat healthy.

*Healthy foods are more expensive.* Women described how the cost of foods influenced their food choices. This is consistent with Glanz, Basil, Maibach, Goldberg and Snyder's (1998) finding that cost is an important determinant of food consumption. Almost all women in both groups ($n$ = 5 with normal weight gain and 6 with excessive gain) stated or implied that healthy foods are more expensive. The price of food has been proposed as one reason for differences in the diets of individuals of lower and higher socioeconomic status (Roos, Prattala, Lahelma, Kleemola, & Pietinen, 1996). Individuals

of lower socioeconomic status have less money to spend on food. In Harnack, Sherwood, and Story's (1999) study of the dietary patterns of urban American Indian women, expense/price was the most common barrier to consuming more fruit and vegetables.

Three women in each group listed foods that they felt were expensive to buy, and they did not buy them or bought them less frequently than cheaper foods. Women with normal weight gain mentioned fruit, vegetables, milk, cheese, yogurt, lean meat, and 100% juices as being expensive. Women with excessive weight gain mentioned fruits, vegetables, lean meats, pork, and cereals. In addition, three women ($n = 2$ with excessive gain and 1 with normal gain) who did not personally experience financial constraints for buying food mentioned fruits and vegetables as being expensive.

Alex (N) pointed out that healthy foods cost more. She noticed that foods such as lean meat and yogurt with less sugar are more expensive than regular meat, and the kind of yogurt that goes on sale has more carbohydrate. She also pointed out that the cheaper alternatives such as regular ground beef require more preparation to remove the extra grease.

> *Cheese is expensive. Like the yogurt, there's certain yogurts that are better than the other stuff and they cost more. There's like lean meat costs more. What else did we come across, like even tofu costs quite a bit. Like there's different things that you can try in your diet but they cost more than the alternative so. Cause I always check out the carbs and this and that nowadays, before I never even looked at it. And the ones that you think hey this is better is more, it costs more than anything else.* (Alex, p.11)

Ruth (E) listed some of the foods she did not buy because they were more expensive:

*Just you know like cereals, I like cereals and those are expensive. Salad stuff is expensive. Meat is really expensive. So then you just buy little packages of this, little packages of that which wouldn't last very long. Whereas when you got that steady income then you can buy bulk and it lasts you.* (Ruth, pp.13-14)

Greta (E) said that if healthy food was cheaper, she would have been able to afford to eat it: "*It's [healthy food] a lot of money. I would be like really happy if it was like, if I could afford it everyday, if it was a cheap price. It is true, it is expensive to go on a diet and eat healthy foods*" (Greta, p.10). The types of foods she found expensive were fruits, vegetables, and pork.

The observation that healthy foods are more expensive is supported in the literature (Drewnowski, 2003). Similar to women's reports of the cost of healthy foods as a barrier to being able to follow a healthy diet, studies have found that the higher expense of healthy foods creates a barrier for the consumption of fruits and vegetables for instance among people with low income and education (Dittus, Hillers & Beerman, 1995; Wandel, 1995; Roos et al., 1996). Kendall, Olson, and Frongillo (1996) found a significant decline in the amount of fruits and vegetables consumed with increasing food insecurity.

*Affordable foods.* Three women with normal gain and two with excessive gain who had financial constraints for purchasing food discussed some of the foods they found affordable. Foods mentioned by the women with normal gain included potatoes, macaroni, meat products, canned foods, yogurt on sale, regular hamburger, and Koolaid. Alex (N) mentioned some of the foods she'd buy when not able to afford the healthier choices:

*We'd end up using just any kind of yogurt, whatever's on sale or whatever at the time and it usually has more carbs in it or it's not as healthy as the other ones. . . . Like you would end up buying regular hamburger or something and then you've got a bunch of grease so then you have to worry about your cholesterol and stuff like this. Then you, and the it just takes more work you gotta try and clean it off better and get rid of all the grease and stuff.* (Alex, p.11)

Anna (N) said she would end up buying Kool-Aid instead of 100% pure orange juice because it was less expensive: "*The healthy foods are more expensive than lots of the non-healthy foods. . . . There was like the 100 percent pure orange juices and different types of juices that I would've liked to buy but I'll just buy like Kool-Aid or stuff like that*" (Anna, p.17).

Affordable foods mentioned by those who gained excessive weight included regular hamburger, fast food, potatoes, macaroni and cheese, and canned items. For instance, Ruth (E) described the foods she could afford: "*Like ground beef, we bought a lot of ground beef. Let's see, potatoes, they're cheap. Macaroni and cheese, that's cheap. Canned stuff like that's high in salt and all that as opposed to making everything from scratch where it would be healthier*" (Ruth, p.14).

Carrie (N) mentioned having to purchase "*something that will last for, 'til we get our next pay cheque. . . . like potatoes, macaroni, like meat stuff, canned stuff, all that*" (Carrie, p.18). Knowing their food must last has been shown to influence the food purchasing behaviours of low-income families (Tarasuk, 2001; Tarasuk & Maclean, 1990). Carrie said the types of foods that would last are potatoes, macaroni, meat, and canned foods. She only rarely bought fruit, implying that it isn't something that would

last: "*I don't think we really bought fruits. But just like once in awhile we'll buy fruit*" (Carrie, p.18). When asked how she found buying vegetables, she said: "*Vegetables we were doing ok. But sometimes it was kinda hard. It will last hey but then after, just like sometimes we can't buy it the next time you know, like we don't have enough [money], we had to like buy the things that we really need instead of. . .*" (Carrie, p.19). Thus, even though she found vegetables could last, they were not always a priority; instead, she had to purchase the things she really needed, suggesting that vegetables were not considered a basic need.

Drewnowski (2003) stated that obtaining adequate dietary energy at a low cost is a priority for low income families. It was clear in the present study that women's priority was to purchase foods that would last even though they wanted to be able to purchase healthy foods. Drewnowski reported a "hierarchy of food prices" (p.838) with fruits and vegetables costing more than fats and sweets such as pop and potato chips. This is consistent with women's observations that cheap foods are less healthy than more expensive foods.

*Strategies to obtain healthy foods.* Two women with normal weight gain discussed the ways they obtained healthy foods such as fruits and vegetables. Alex (N) had a vegetable garden where she obtained most of her vegetables. She said, "*I was getting most of my vegetables like lettuce and stuff from the garden*" (Alex, p.10). She also bought fruit and vegetables from farmer's trucks in the summer because they were less expensive and used seasonal fruits such as Japanese oranges and bananas in the wintertime. Sally's (N) family members all contribute money towards groceries which enabled them to afford healthy foods such as fruits and vegetables: "*I think it has a lot to*

*do with what people make, why they eat that way because like junk foods are cheaper than healthy food. . . . Here we all chip in so we always buy like healthy food and vegetables and fruit, stuff like that*" (Sally, p.14).

*Summary.* In summary, most women felt that income influences the ability to follow a healthy diet and some women in each group personally experienced financial constraints that affected their eating. Most women also felt that healthy foods were more expensive than unhealthy foods. A few women with normal weight gain mentioned strategies to obtain healthy foods. Income and the cost of foods were clearly factors that impeded women's ability to eat healthy. For some women, despite being motivated to eat healthy, their economic environment prevented them from doing so.

*Income Affects Physical Activity*

Four women with excessive weight gain mentioned income as a barrier to physical activity. However, it was not as much of a barrier as for eating. None of the women with normal weight gain mentioned income as a barrier to physical activity. Debbie (E) discussed membership fees as a potential barrier to using gym facilities: "*There is some people that don't have the transportation to go into town and to go to a gym and there's the membership too and I'm not sure if people can afford that. So it is difficult to get physical activity around here*" (Debbie, p.14). Most women who discussed money as a barrier to physical activity also mentioned walking as an alternative to recreational activities that require an expense. For instance, Greta (E) said that money limits the ability to go to a nearby town where there are facilities for physical activity but said she walked for activity: "*Like you have to go all the way to [town name] and it's*

*really hard to get like gas money depending on if you're on welfare, it's really hard to get there. Myself I just do my regular walks and get fresh air*" (Greta, p.18). Val (E) also said, "*I think spending outside more, like cause you get fresh air and. Cause people don't have the money to go to Curves. Mostly you can work out anywhere on a low budget*" (Val, p.21).

The cost of participating in physical activities has been reported as a barrier to being active (Eyler et al., 2002). Lower income has also been associated with less physical activity among American Indian women and pregnant women (Fischer et al., 1999; Ning, et al., 2003). It is interesting to note that none of the women with normal weight mentioned cost or income as a barrier to getting physical activity despite having similar income levels as those with excessive weight gain. It may be that more women with normal weight gain were satisfied with walking as a form of physical activity and did not feel the need to exercise in facilities.

*Vehicles.* Access to a vehicle is partly related to one's family income level. Two women with normal weight gain and one with excessive gain mentioned the negative influence of vehicles on physical activity. For instance, Fay (N) said the reason she did not get more walking was because she had a vehicle which she used for transportation: "*I got spoiled with a vehicle I guess, having a vehicle, and knowing I had it I could just use it to drive you know wherever I had to get*" (Fay, p.4).

Kate (E) felt that having a vehicle makes it difficult for women to get physical activity. She thought that if she had a vehicle, she would have walked less. She said, "*If I had a vehicle I probably would've been riding instead of walking. . . . Iif I had a vehicle I wouldn't be walking I'd just be walking out to the car, getting in and driving were you*

*want, that's how easy it is*" (Kate, pp.14-15). She thought that women would get more physical activity if they did not rely so much on vehicles. When asked what would help women to get more walking, she said:

> *Well they have to lose their vehicle first. (both laugh) If they have a vehicle that would be the first thing they have to try and get rid of. Cause I didn't have a vehicle when I was pregnant so that's the reason why I did a lot of walking. If I had a vehicle I probably would've been riding instead of walking. So if you have a vehicle, lose a vehicle.* (Kate, p.14)

Fay and Kate's belief about the contribution of vehicles to their activity levels is consistent with the literature that suggests the reliance on vehicles is a contributor to sedentary lifestyles (Wadden et al., 2002).

*Summary.* Slightly more than half of the women with excessive weight gain felt that income was a barrier to participating in physical activity. However, most of them also believed that walking was an appropriate, low-cost form of activity. A few women discussed the negative influence of vehicles on physical activity. The influence of income level on physical activity was not as important as its influence on healthy eating.

*Income Influences Stress*

For some women, their economic situation contributed to their level of stress during pregnancy. Two women in each weight gain group mentioned being stressed because of finances. As previously discussed, stress has implications on prenatal health behaviours and weight gain. When asked about any stress she experienced in pregnancy, Fay (N) said:

*Well financially ya there was. . . . Just you know the fact that not having any money to like do anything with my son like bring him to places and like travel with him. And then closer to the end of my pregnancy, it was like not being able to get her stuff that I wanted to get her.* (Fay, p.5)

She described how her financial constraints made her feel: "*It made me feel like very depressed. Like I was like crying and getting angry. And then like it made me get to the point where I was trying to find a job but I knew I couldn't because I was pregnant*" (Fay, p.5). Kate (E) described her experience with finances:

*I'd stress out because like there'd be times where I'd have it rough hey and I'd need something but I wouldn't have the money to do it hey so I'd get stressed out hey and I'd go out and try and get the money to do that and then you know I'd feel better after that. . . . Like you know there'd be times where I wanna like go get a movie or you know just something to keep me occupied but I wouldn't have the money to do it right away. So I'd go out and I'd look for the money. Like a lot of people helped me out, other people but then I kinda didn't like to bother them as much. Well I don't really like to bother people for anything so that's why I just did it on my own.* (Kate, pp.10-11)

*Summary*

Women's economic environments influenced their ability to purchase healthy foods and participate in physical activity, and thus influenced prenatal weight gain. For some women, the economic environment also added stress in their lives which influences health behaviours as previously discussed. Low income was more of a barrier for healthy

eating than it was for physical activity. Although some women with excessive weight gain viewed financial constraints as a barrier to physical activity, they also viewed walking as a cheap alternative to activities that involve a cost. Almost all women believed that income influences the ability to consume a healthy diet and that healthy foods were more expensive than unhealthy foods.

### *Access*

Women with normal and excessive weight gain described the lack of access to healthy foods and opportunities for physical activity as barriers to healthy eating, physical activity, and healthy weight gain. Swinburn, Caterson, Seidell, Dietz, and James (2002) suggested that environments which are "relatively deprived of healthier food choices and opportunities for physical activity" (p.18) explain the relationship between low socioeconomic status and obesity among women.

Access to healthy foods, fast foods, and recreation facilities all depended on where women lived. Six women with excessive weight gain and four women with normal weight gain lived in the Aboriginal community itself and the remaining women lived in surrounding towns. Even though more women with excessive weight gain lived in the Aboriginal community, two of them lived extremely close to a nearby town. Other women who lived in the Aboriginal community lived either in the community's town site or in more remote areas.

The Aboriginal community borders on a small town where there are large grocery stores and recreation facilities such as a swimming pool and gym. Thus the women who lived in this town or very close to it had easier access to these amenities due to their

proximity. The Aboriginal community's town site is located approximately 30 km from the surrounding towns. Thus women living in the town site or more remotely in the Aboriginal community did not have easy access to the amenities of nearby towns, especially if they did not have access to a vehicle. In the Aboriginal town site, there is one small grocery store with limited healthy choices such as fruits and vegetables. In addition, there are at least three small convenience stores, stocked with mainly low nutritional value foods. Pizza and tacos are also available in the Aboriginal community.

*Nutritional Environment*

Women discussed both the convenience of fast foods and junk foods and the lack of healthy foods as barriers to healthy eating. This is consistent with Egger and Swinburn's (1997) model of the influences on obesity in which foods in local stores and the proximity of fast food restaurants are components of the physical environment that influences individuals' ability to eat a healthy diet.

*Prevalence and convenience of junk foods and fast foods*. Five women in each group found fast food or junk foods to be convenient or prevalent. Julie (N) thought that there is too much fast food available and it makes it hard for people to eat healthy because it is so tempting.

> *I think it's too, there's too much of the same, like the convenient, fast foods available. There's not enough places, especially on the reserve, that do provide the alternative healthy choice type of menu. And I think that's for everybody, not just people that are pregnant, run into problems. You go over here and it's fried chicken, hamburger and fries, fries, fries all over the place you know. And I think*

*it's really hard cause it is really tempting. It's easy to go astray if you're not, if you're not strong willed.* (Julie, p.15)

Alex (N), who is a single mother, discussed the convenience of fast food:

*I think if you're in the middle of everything it's so much easier to run down to Dairy Queen and then if you got kids, that's what they would rather have than a home cooked meal. And I think ya, it does make it harder to do things, especially the fast food places around. . . .It makes it harder for you to go home and cook a meal when you can just run downtown for ten bucks and buy something to eat.* (Alex, p.21)

Alex (N) also said she would end up getting fast food in order to avoid the time and effort required to prepare a meal and clean up afterwards:

*For me to have to cook and clean, cook and clean, cook and clean doesn't make sense to me. . . . So that's why I ended up doing fast food cause then that way I could throw it all in the garbage, I didn't have to start doing dishes. And being at home after a year of breakfast, lunch, supper, cook, clean, cook, clean, cook, clean, I was going crazy. I don't know how people can do that and I just, I can't find the reasoning behind it. Like I know I gotta eat, but I'll just eat something that you don't have to put on a plate or have to do massive dishes for afterwards. Not to do dishes four or five times a day.* (Alex, p.19)

Even though they thought fast food and junk foods are convenient and available, one woman with normal gain and two women with excessive gain said they are not convenient for those who live remotely in the Aboriginal community. For instance,

Carrie (N) said that living out in the prairies made it easier to eat healthy because fast food is not as accessible.

> *The easy thing about it is when you have no money you can stay home. Cause you got ~~no~~ like, no gas or anything to drive to town. That's the easiest thing to eat healthy. But the hard thing about it is when you go to town and like when you have the money you can do anything you want to do. I think it's easier to stay out here then in town. Like every time you got money you can go to like 7-11© and get something or go downtown and get some McDonald's© or something. And here you have to like suffer for like a day or a week then you can. But I think that's the easiest thing to live out in the prairies. You don't crave a lot and don't want all that.* (Carrie, p.19)

Olivia (E) thought that women who live farther away from town probably eat healthier because fast food is not as accessible so they would purchase more groceries. When asked whether she felt that fast food or junk foods were convenient for her, Olivia said:

> *Well not for me, like living, when I was living out here. Like if you lived like closer to town then yes. Just farther away, the farther away, you probably like get more groceries and you'll end up probably eating a bit more healthier than the ones living closer.* (Olivia, p.18)

Overall, most women felt that fast foods and junk foods were prevalent and convenient, and felt that this made it difficult to follow a healthy diet.

*Limited availability of healthier options.* Two women in each group mentioned that the limited access to healthy foods affected their eating. Debbie (E) said that it was

hard for her to follow a healthy diet because of the prevalence of junk food and lack of stores that sell healthy foods. When asked what made it hard for her to eat a healthy diet, she said: "*I'd have to say the convenience of junk food at the store or fast food when you're in town. It's just more convenient because there's not really places that sell healthy food*" (Debbie, p.12).

Kate (E) discussed how healthy foods such as vegetables are inconsistently available in the small grocery store in the Aboriginal community. For instance, sometimes they are not available at all and other times they are of poor quality. When discussing healthy foods, Kate said:

> *Sometimes they're not there and other times they are. It's just like, you know when you go up here and you know there's things there that you want but there's other things you want and it's not there. So sometimes it's there and sometimes it ain't. . . . Like their vegetables. They hardly, sometimes they have vegetables and other times they don't. Like and sometimes they're not good, like they've been there too long or something.* (Kate, p.23)

Sally (N) also said that in the small grocery story in the Aboriginal community, there are not many healthy choices and she said the lack of healthy choices contributed to her eating junk food. She said, "*There's only like one supermarket, that's the only place where they sell like fruit and vegetables. Cause the other places don't really sell fruit and vegetables. So like getting something easy to eat like would probably be just like junk food like pizza and stuff like that*" (Sally, p.11-12).

Two women with normal weight gain mentioned gardens as a source of vegetables. Alex (N) got most of her vegetables from her garden. Julie (N) said in

previous years she was able to get vegetables from her garden but during her pregnancy, the grasshoppers ruined them:

> *The year before I had a garden and so we learned how to make a hundred different salads and stuff with spinach. But this year the grasshoppers cleaned up everything so we didn't have, and then we grilled a lot of zucchini and ate a lot of zucchinis the year before. So we didn't have, I wasn't able to have that readily available, variety from the garden that we had the year before to make things different.* (Julie, p.12)

Women's mention of the environmental influences on eating is consistent with the obesity literature that emphasizes the environment's influence on obesity. The environment exposes individuals to energy-dense, heavily advertised, inexpensive, and highly accessible foods (Battle & Brownell, 1996). Wadden et al. (2002) identified the increase in fast food restaurants, large and growing portion sizes, minimarts in gasoline stations, and potent food advertising as components of the environment that contribute to overeating. The environment that the women have described promotes unhealthy eating in that fast foods and junk foods are prevalent and convenient, and healthy food choices are limited. The barriers created by the nutritional environment influenced their ability to follow a healthy diet, which is consistent with the literature.

The prevalence and convenience of fast foods, limited prevalence of healthy foods, time and effort required to prepare healthy foods, and increased cost of healthy foods acted together in ways that impeded healthy eating. Following a healthy diet was clearly a more difficult option when considering women's economic and physical environments.

*Physical Activity Environment*

Women had different views about access to opportunities for physical activity such as programs and facilities as an influence on physical activity. Five women with excessive gain and two with normal gain mentioned the accessibility or availability of facilities or programs as a limitation to getting physical activity. Sally (N) felt that women do not have the opportunity to be physically active because there are not facilities or programs for pregnant women and this makes it hard for them to gain healthy weight. When asked what makes it hard for women to gain a healthy amount of weight, she said: "*I guess cause there's no real, like around here there's no real, there's no place to go and you know be active like programs for pregnant women. They just have like prenatal class*" (Sally, p.8). Sally also mentioned that especially during the winter there are not indoor facilities for women to be active: "*Because of the weather. Around here there's not really anything for somebody to like go do indoors*" (Sally, p.2).

Val (E) said she wanted to participate in water aerobics but they were only offered in a community approximately 45 km from where she lived. Carrie (N) agreed that there is not much opportunity for physical activity in the Aboriginal community and she thought a gym or program would help:

> *There's hardly anything to do. There's like no free gyms to go like practice or like there's like no volunteers to bring women out to do some exercise or some kinda things like that. . . . A gym or something or some program. Ya I think it would work. Go to a program to help you lose weight. I think it would really work.* (Carrie, pp.19-20)

Debbie (E) felt that it is difficult to get physical activity in the Aboriginal community, but she personally had access to exercise equipment at her parent's home. She said:

> *There is some people that don't have the transportation to go into town and to go to a gym and there's the membership too and I'm not sure if people can afford that. So it is difficult to get physical activity around here. . . . Well I never found it difficult because at my parent's there's like, basically they have a gym there. Like they have weights and a treadmill and a glider, a stepper. They have a lot of stuff.* (Debbie, p.14)

Olivia (E) thought that a lack of facilities was not necessarily a barrier to getting physical activity but she said that having access to a gym would help motivate women to be active. She said, "*I guess if you live out here all you can do is just walk and if you don't really like the outdoors, it's not much of encouragement or ya. Say if they had a gym nearby or something to like. It will, like it will motivate you to do more physical activity*" (Olivia, p.18).

In contrast, three women with normal weight gain and two with excessive gain did not think access to physical activity opportunities was a barrier to being active. Anna (N) said, "*I think you, it is ok to do physical activity things anywhere, to go for walks in town or in the country wherever you stay. So I don't think it's hard to do physical activities*" (Anna, p.15). Julie (N) said women do not need a fancy facility to get physical activity, they can just go for a walk:

> *I think it's very easy, you don't have to go to a facility to exercise. You can, just going for a walk is enough to do. It does a lot of good just walking. And maybe*

*the issue for town site [centre of Aboriginal community] would be lots of dogs you have to be careful of. But they could go, like we walk the track everyday and we're not bothered by anybody so, I think that you don't need a fancy facility for that.* (Julie, p.16)

Alex (N) also felt that high-tech training centers are not necessary to be active:

*If you got a VCR, get a videotape. All you gotta do is walk out your front door and keep walking. I don't believe in training centers and these Curves and all that stuff. If you wanna you're gonna get out and do it. If you don't then it's just not gonna happen. . . . I'm not into these high-tech training centers and stuff like that. I'll pump weights and stuff like that but I'm not into all these high-tech machines and stuff. Like if you have a bike, you can go bike riding and horses, horseback riding. If you got runners you can go for a walk. . . . I don't think that you need all these high-tech places to do all this work out.* (Alex, pp.21-22)

Although some women felt that a lack of recreation facilities or programs did not pose a barrier to physical activity, more women felt that it did create a barrier to physical activity. Interestingly, more women with excessive weight gain felt that a lack of opportunities for physical activity was a barrier to being active compared to those with normal weight gain. As discussed in relation to income and physical activity, it may be that women with normal weight gain were more satisfied with walking as a means of physical activity.

In a review of the literature on the determinants of physical activity, Eyler et al. (2002) concluded that the physical environment "plays a vital role in health behaviors, particularly physical activity" (p.248). Eyler et al. reported that studies have found a lack

of places to exercise as a barrier for physical activity, including among American Indian women. Thus, women's perceptions about the lack of access to opportunities for physical activity are consistent with barriers reported in the literature.

Women also mentioned barriers to walking. One barrier to walking was the weather as will be discussed in the following section. Another barrier was the prevalence of stray dogs in the Aboriginal community, as mentioned by two women with normal weight gain. Carrie (N) said, "*There's wicked dogs. . . . Just like wicked dogs, you can't jog or go run or dogs will attack you*" (Carrie, p.20). Julie (N) said, "M*aybe the issue for town site would be lots of dogs you have to be careful of*" in terms of being able to get physical activity (Julie, p.16). In contrast, Alex (N) said dogs were not a barrier for her personally because she was not afraid of them: "*I have no issue with dogs whatsoever so. I mean a dog can only hurt me from my knees down. (laughs) So I don't know, I always got along good with dogs. So it's totally not even an issue*" (Alex, p.22).

*Weather.* In addition to the availability of programs and facilities, women also mentioned the weather as contributing to their opportunities for physical activity. Weather was mentioned by five women with normal gain and two with excessive gain as a barrier to physical activity. Both summer and winter presented challenges for obtaining physical activity, winter because of the cold and ice, and summer because of the heat. For instance, Alex (N) enjoyed getting outside but worried about falling on the ice: "*Just sometimes it was scary with the ice outside and worrying about slipping*" (Alex, p.5). Sally (N) was not as physically active during a previous pregnancy because she was pregnant during the winter, whereas during her most recent pregnancy she was more active because she was pregnant through the summer. Kate (E) also found it more

difficult to get physical activity during the winter compared to the summer: "*Like in the winter it's kinda too cold to be walking, out walking around and stuff. But if it's the summer ya you can just go walking and do whatever. In the winter it's kinda hard to get out cause like you prefer to stay home cause it's too cold*" (Kate, p.18). Julie (N) said she was very concerned about slipping on the ice because she had fallen a few times. When asked what made it hard for her to get physical activity, she said: "*Before it was like wintertime and I've had a couple of bad falls on the ice out here in the parking lot and was very leery of falling, especially with being pregnant. That was the big one*" (Julie, p.13).

Unlike Sally and Kate who were more active when pregnant through the summer, Anna (N) and Fay (N) found that the heat during the summer made it difficult to get physical activity. Anna said it was hard to do physical activity "*late in the summer when it started to get difficult because of the heat*" (Anna, p.4). Weather has previously been reported as a barrier to physical activity among American Indian women (Eyler et al., 2002).

It is interesting that more women with normal weight gain found the weather to be a barrier to healthy weight gain. It may be that these women were making more attempts to be active and thus were more likely to encounter weather as a barrier.

### *Summary*

The economic and physical environment presented challenges for women to eat healthy and be physically active. Women's financial constraints and access to affordable, healthy foods limited their ability to eat healthy. Financial constraints and access to

opportunities for physical activity as well as the weather all posed barriers for physical activity. Approximately equal numbers of women in each group experienced financial constraints for purchasing healthy foods; however, more women with excessive weight gain felt that income limited their ability to be physically active. Almost all the women felt that healthy foods were more expensive and fast food and junk food are readily available. Equal numbers of women with normal and excessive weight gain found that junk foods were prevalent and convenient, and healthier options were limited. More women with excessive weight gain felt that access to opportunities for physical activity was a barrier to being active.

## Summary

This chapter has revealed the many themes that became apparent as influences on women's eating, physical activity, and prenatal weight gain. The themes were organized into *personal factors*, *the social environment*, and *the economic and physical environment*. Both similarities and differences in the themes existed between women with normal and excessive prenatal weight gain. The following chapter will describe the interrelations between the themes.

# CHAPTER 5:

# CONCLUSION

## Interconnections

The purpose of this research was to better understand excessive prenatal weight gain among Aboriginal women. The study sought to identify differences in characteristics of women who gain normal and excessive weight during pregnancy and to determine women's perspectives on the facilitators and inhibitors of healthy weight gain. In maintaining an asset-based approach, the study examined the factors that help some women to gain normal weight during pregnancy in addition to the factors that contribute to excessive weight gain among other women. It was evident from the interviews that healthy and excessive prenatal weight gain are complex phenomena with multiple, interrelated influences.

Health promotion concepts emphasize the importance of socioenvironmental influences on health (Reutter, 2001; World Health Organization, 1996). Individual health practices must be understood within the environmental context. In this study, the social, economic, and physical environments in addition to personal factors were central to women's health practices and in turn prenatal weight gain. Women's environments both supported and hindered their health behaviours.

Themes relating to personal factors, the social environment, and the economic and physical environments directly influenced women's eating and physical activity behaviours, which in turn influenced weight gain. Furthermore, there were interconnections among the themes. This chapter will explore the interconnections among the themes and their influence on weight gain, and will highlight important

similarities and differences in themes between women with normal and excessive prenatal weight gain. A visual representation is presented in Figure 1.

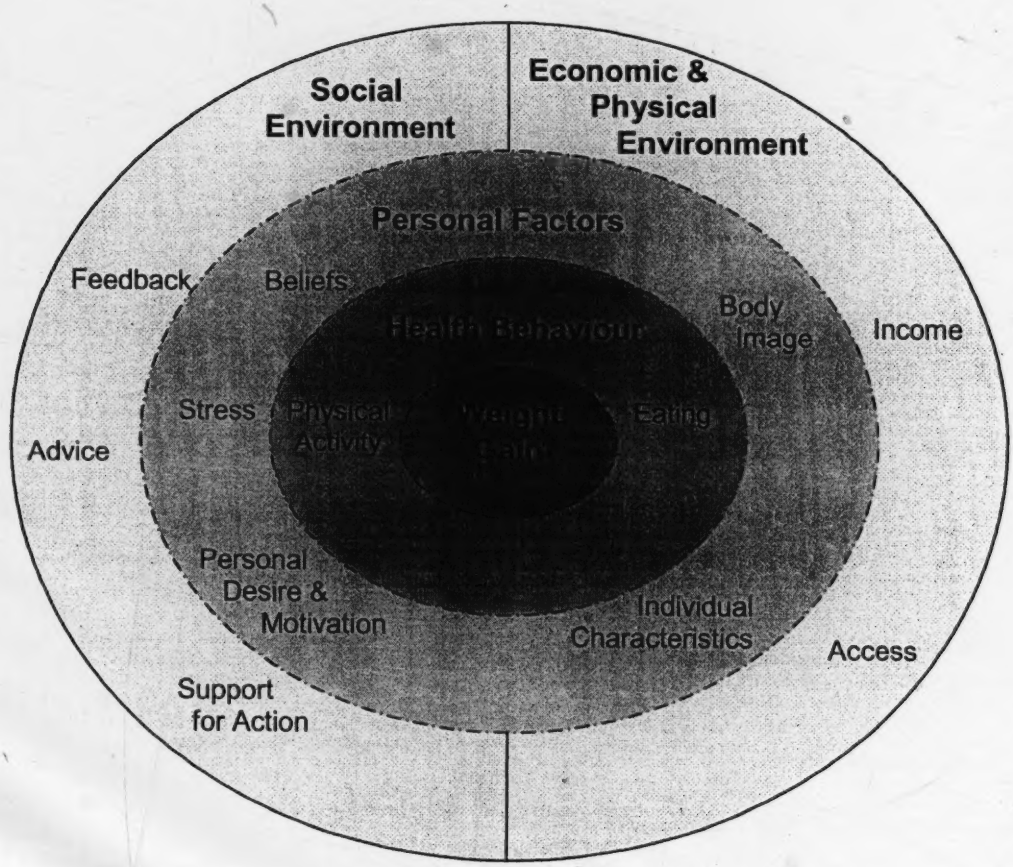
Ideally, personal factors, the social environment, and the economic and physical environment should act in constructive ways to influence eating, physical activity, and weight gain to enable women to achieve healthy weight gain. In other words, the combination of personal, social, and economic and physical environmental factors should act together in ways that promote health behaviours and in turn healthy weight gain. It is when aspects of one or more of these components are lacking or unconstructive that the likelihood of gaining excessive weight increases.

### *Personal Factors*

Personal factors include the following themes: beliefs about weight gain, eating, and physical activity; body image; personal desire and motivation; individual characteristics such as cravings; and stress. There were both similarities and differences in these themes between women with normal and excessive weight gain. Personal factors directly influenced women's eating and physical activity behaviours, and in turn weight gain. Because of the interrelations among the themes, personal factors also indirectly influenced behaviour and weight gain.

More women with normal weight gain were able to suggest an appropriate weight gain range. In fact, only one woman with excessive weight gain was able to do so. In addition, more than half of the women with excessive gain believed their weight gain was healthy. Thus, women with excessive weight gain had inadequate information about healthy weight gain, and believed their weight gain was healthy when in fact it was high.

*Figure 1.* The Multiple Influences on Prenatal Weight Gain



This situation undoubtedly influenced women's motivation and efforts to control their weight gain through increasing physical activity or changing their eating habits. As will be discussed in later sections, the social environment played an important role in women's beliefs about weight gain.

In addition to beliefs about weight gain, women's beliefs about healthy eating and physical activity impacted their eating and physical activity behaviours. Most women with excessive weight gain believed that they were eating for two during their pregnancy. In contrast, the majority of women who gained normal weight believed that pregnant women should eat normally, or just slightly more than usual. It can be implied that women's food intake, and in turn weight gain, were affected by their belief about whether or not to eat for two. Women with excessive weight gain likely consumed more food because they believed they were eating for two. For some women, there was a disconnection between their beliefs about healthy eating and their actual food intake. Specifically, several women with excessive weight gain believed that junk foods should be avoided during pregnancy, yet reported consuming relatively high amounts. In contrast, most women with normal weight gain successfully limited their junk food consumption. For women with excessive weight gain, their social environment clearly played a role in the disconnection between their beliefs and actual consumption as will be discussed in later sections.

Differences between the groups in terms of feelings about their bodies were not evident. Most women had negative feelings about their bodies during pregnancy. However, there was a difference in women's feelings about gaining weight between the

groups: all women with excessive weight gain expressed negative feelings about gaining weight compared to only half of women with normal weight gain.

Women's personal desire and motivation to be active and to eat healthy were identified by the women as being important influences on eating, physical activity, and weight gain. The factors that motivated women to eat healthy and be active were variable, and controlling weight gain was not a significant motivator for women in either group. Other motivators included preventing a difficult labour, promoting the baby's health, and avoiding diabetes. Desire and motivation to eat healthy and be active were influenced by women's beliefs about eating, physical activity, and appropriate weight gain.

Personal characteristics clearly influenced health behaviours and weight gain. Almost all women in both groups experienced food cravings which made it difficult for them to follow a healthy diet. As well, factors resulting from women's physical state of pregnancy including pain and discomfort, medical conditions, and fatigue influenced their level of physical activity. More women with excessive weight gain mentioned pain and discomfort and fatigue as barriers to being active. Even for women who were motivated to be active, barriers such as pain, discomfort, and medical conditions impeded their efforts to be active. These factors undoubtedly resulted in less motivation to be active. Stress also influenced motivation and health behaviours, although in variable ways. Almost all women had stress in their lives during pregnancy. Some women ate more as a result of stress, and others ate less. As well, some women got more physical activity while others got less in times of stress. There were no differences between the groups in terms of the impact of stress on health behaviours.

Overall, personal factors both facilitated and hindered health behaviours and healthy weight gain. However, even personal factors that contributed positively to healthy weight gain were not sufficient for optimal health behaviours and weight gain. For instance, even when women had appropriate beliefs and personal motivation, their efforts to be active or eat healthy were impacted by their support (or lack of), and their access to healthy foods and opportunities for physical activity. Personal factors do not occur in isolation but are rather integrally related to the other themes within the social, economic, and physical environments.

### *The Social Environment*

There are two main ways that the social environment contributed to healthy or excessive weight gain. First, social support acted as a direct mediator, influencing women's efforts to be active and eat healthy in both positive and negative ways. Second, social support affected weight gain indirectly through influencing personal factors in both constructive and unconstructive ways. Differences existed in the social environments of women with normal and excessive weight gain.

#### *Social Support as a Mediator*

Whether or not a woman acted on her beliefs about the benefits of healthy eating and physical activity or her personal desire to eat healthy and be active depended partially on the support she received. Social support acted as a mediator for action, both promoting and inhibiting health behaviours and in turn influencing weight gain. More women with excessive weight gain had social influences that inhibited health behaviours,

and fewer influences that promoted such behaviours. For example, despite their belief that junk food and fast food should be avoided during pregnancy, most women with excessive weight gain continued to eat relatively high amounts. It should be noted that detailed information about food consumption was not obtained to verify women's subjective reports of their eating. Most women with normal weight gain were successfully able to limit their junk food consumption, whereas only one woman with excessive weight gain was able to do so. This difference may lie in the fact that women with normal weight gain expressed having more support and fewer negative influences than those with excessive weight gain. In fact, five women with excessive weight gain compared to only one woman with normal gain discussed how others' eating negatively influenced their ability to eat healthy.

Furthermore, having a companion for physical activity seemed to act as a mediator between personal factors such as motivation or beliefs about the benefits of physical activity and actual physical activity. All women with normal weight gain had companions for physical activity, while only one woman with excessive weight gain had a companion. Women discussed companions as potentially affecting the enjoyability, frequency, and duration of their physical activity and said having a companion made it easier to get physical activity.

Women with excessive weight gain received inconsistent support from others. For instance, all women with excessive weight gain received advice to eat healthy and be active; however, they did not receive instrumental support to act on this advice. As previously discussed, others negatively influenced their eating by eating junk foods in front of them. They also lacked others to help motivate them to be active or accompany

them during physical activity. In contrast, women with normal weight gain did not have the same inconsistencies in the support they received; others were supporting them in achieving healthy behaviours.

Women with excessive weight gain responded negatively to others' advice to eat healthy. They were reluctant to change their eating as a result of the advice. This may be explained by the lack of support for action they received for making changes.

*Social Support Influences Personal Factors*

In addition to acting as a mediator for health behaviours, social support influenced women's personal factors including their beliefs, motivation, body image, and stress. The influence was both constructive and unconstructive. Social support impacted women's beliefs through the provision of advice (or lack of advice) about healthy weight gain, eating, and physical activity, and through feedback about weight gain from health professionals. The majority of women who gained excessive weight were misinformed or uninformed about healthy weight gain, and received inappropriate or a lack of feedback about their weight gain. A similar number of women with normal weight gain had not received information about healthy weight gain, but were able to base their ideas about healthy weight gain on their previous pregnancies. Only one woman with excessive weight gain had been pregnant previously whereas all six women with normal weight gain had been pregnant before.

The impact of being misinformed about healthy weight gain, and receiving inappropriate feedback was evident in that four women who gained excessive weight believed their weight gain was normal. If women believe their weight gain to be normal,

it can be inferred that they will be less motivated to take action to control it, such as eating healthy or being active. In other words, they have no reason or incentive to control their weight gain because they believe their weight gain is healthy, and have not received feedback that suggests otherwise. Only one woman with excessive weight gain received appropriate feedback from her doctor that her weight gain was too high. This feedback motivated her to work harder at being physically active.

It was evident that informational support from others influenced women's beliefs about the benefits of physical activity in positive ways. All women discussed the benefits of physical activity, and many of them had received the information from others. Many women with both excessive and normal weight gain increased their activity, or personal desire to be active, because of others' encouragement. Thus, information and encouragement also influence women's motivation. However, it was evident that information and encouragement alone were not sufficient to promote health behaviours. Support for action or instrumental support was also important in promoting health behaviours, as discussed previously.

The social environment also influenced women's level of stress, which had implications for eating and physical activity. Almost all women identified others as contributors to their level of stress. However, some women also mentioned how support can help alleviate stress.

### *The Economic and Physical Environment*

Similar to the social environment, the economic and physical environments influenced prenatal weight gain directly as a mediator of women's efforts to eat healthy and participate in physical activity, and indirectly by influencing personal factors.

#### *Economic and Physical Environment as a Mediator*

Women's income and access to healthy foods and opportunities for physical activity mediated their efforts to eat healthy and be active. For many women, income was a limiting factor for being able to purchase healthy foods. Women described having to purchase foods that they could afford and that would last, and these were not always healthy choices. Almost all women in both groups mentioned that healthy foods were more expensive than less healthy foods. Women also described the convenience of fast foods and junk foods and the lack of healthy foods as barriers to healthy eating. Thus, even if women had appropriate beliefs about healthy eating and were motivated to try and follow a healthy diet, many were faced with barriers in affording and accessing healthy foods. Similar numbers of women in each group reported financial constraints and difficulties accessing healthy foods.

Interestingly, only women with excessive weight gain mentioned income as a barrier to physical activity because of the cost of using recreational facilities or not being able to afford gas to get to town where recreation facilities were located. More women with excessive weight gain also felt that the lack of availability of facilities and opportunities for physical activity were barriers to getting physical activity. Women with

normal weight gain seemed to be more satisfied with walking as a means of physical activity. Additionally, the weather posed a barrier to physical activity for some women.

*Economic and Physical Environment Affects Personal Factors*

The personal factors most influenced by the economic and physical environments were personal desire and motivation. It can be implied that the limitations on women's ability to purchase healthy foods and to use recreation facilities due to financial constraints or inaccessibility affected women's motivation to eat healthy and be active. For instance, women who felt they could not afford or did not have access to recreational facilities were less motivated to be active. Similarly, women's motivation was negatively impacted by the prevalence of junk food and fast food, and limited healthier options. Another personal factor that was influenced by income was women's stress level. A few women with both normal and excessive weight gain were stressed because of financial concerns.

*Summary*

This study determined that there are multiple, interconnected influences on eating, physical activity, and in turn, prenatal weight gain. Health behaviours including eating and physical activity were influenced directly by personal factors, the social environment, and the economic and physical environment. The influence was both positive and negative. As well, it has been demonstrated that the social, economic, and physical environments influenced health behaviours indirectly through influencing personal factors either negatively or positively. The findings from this study emphasize the

importance of taking into account the socioenvironmental influences on prenatal weight gain.

Differences existed between the two groups in terms of their personal factors, social environment, and perceived economic and physical environment. Women with normal weight gain had more personal factors, social influences, and perceived environmental conditions that promoted healthy weight gain. In contrast, for women with excessive weight gain, these factors were less supportive of healthy weight gain. For instance, women who gained excessive weight were more likely to have inappropriate beliefs, inappropriate feedback about their weight gain, inadequate support for action, and more perceived financial and access barriers.

## Recommendations for Practice and Future Research

### *Recommendations for Practice*

Given the multiple and interconnected influences on prenatal weight gain, efforts to promote healthy weight gain must target many levels. An ecological framework is useful to organize recommendations for health promotion initiatives. An ecological framework identifies interdependent levels of influence including intrapersonal (individual), interpersonal, organizational, community, and public policy (McLeroy, Bideau, Steckler & Glanz, 1988). Sallis and Owen (2002) proposed that strategies focused at a single ecological level are unlikely to have powerful or sustained effects. Rather, multilevel interventions will be most effective. The findings from this study suggest that the individual, interpersonal, community, and policy levels should all be targeted by health promotion interventions to promote healthy prenatal weight gain.

*Individual Level*

The individual level addresses women's personal factors. Interventions at this level should promote accurate knowledge about eating, physical activity, and healthy weight gain. Particular attention should be given to women who have not had experience from previous pregnancies. All of the women in the study who had normal weight gain had been pregnant previously and drew on their experiences. In contrast, only one woman with excessive weight gain had been pregnant previously.

Many women with excessive weight gain believed they needed to eat for two during pregnancy. Better understanding of what it means to eat for two needs to be communicated to women early in pregnancy. Eating for two does not mean that women need to eat much more during pregnancy; rather they need to eat only slightly more than usual. This information could be provided to women through a discussion about eating with the public health nurses during their initial prenatal visit. Based on women's comments, pamphlets or printed material alone are not sufficient to inform women. A challenge with providing information to women early in pregnancy is that women do not necessarily receive prenatal care in their first trimester. The prenatal program services pregnant women as soon as they become aware that a woman is pregnant but this may not be until later in pregnancy.

Women should also be provided with information about healthy weight gain at the beginning of their pregnancy. It was evident from the interviews that most women did not receive information on appropriate weight gain for their prepregnancy BMI. It is important that accurate weight ranges be provided based on women's BMI category

because women classified as overweight or obese should gain less weight than those with normal weight (Health Canada, 2002).

Women should also be provided with appropriate feedback about their weight gain in a sensitive manner, keeping in mind the impact it may have on body image. Almost all women had negative feelings about their bodies during pregnancy, and women with excessive weight gain in particular had negative feelings about gaining weight. When women receive no advice or inappropriate advice about their weight gain from health professionals, they have no reason to take action to control it from a medical perspective. In other words, when women with excessive weight gain were told their weight gain was good, or were not provided with feedback about their weight gain despite being weighed, they were under the false assumption that their weight gain was healthy.

In terms of information about physical activity, women should be encouraged to gradually increase their level of physical activity if they were previously inactive, or to continue with physical activity if they were already active. A few women expressed concern about the implications of physical activity on the baby. Women should be reassured that physical activity within recommended guidelines is safe and encouraged (Davies et al., 2003). Most women responded positively to others' advice to be active.

It is particularly important that the individual level alone does not become the focus of health promotion interventions. By focusing on this level, there is the potential for victim-blaming, whereby individuals are held responsible for their health regardless of the environmental contexts in which they live. Victim-blaming can result in feelings of disempowerment, personal failure, guilt, and inadequacy. As revealed through

analysis of the interview data, information alone is not sufficient to promote health behaviours and healthy weight gain. Targeting other levels in addition to the individual level will help support women in achieving health behaviours and healthy prenatal weight gain, and will help prevent victim-blaming.

*Interpersonal Level*

The social environment was an important influence on prenatal weight gain. Women need to be provided with positive social support that promotes health behaviours. A few women discussed the positive influence that health professionals had on their spouses or family members' support. Involving others during the prenatal visits and encouraging them to help support the pregnant woman could help strengthen the support women receive. It should be emphasized to family members that they should participate in health behaviours along with the pregnant woman instead of simply telling her what to do. For instance, they should avoid eating junk food around the pregnant woman and should accompany them on walks.

Small group interventions would also be beneficial to create a supportive social environment for women. These could include walking groups, community kitchens, or community gardens. Community kitchens and gardens have the potential to provide women with nutritious foods or meals, thus improving access to low cost, healthy foods. They can also provide a supportive environment where women can share experiences related to pregnancy. The support created through small group initiatives could positively contribute to women's psychosocial wellbeing by lessening stress, feelings of depression, and negative feelings about their bodies or gaining weight.

Walking groups could also provide enhanced social support along with support for action. All women who gained normal weight had companions to walk with, and most of them felt that having a companion helped them to get more physical activity. In contrast, only one woman with excessive weight gain had companionship for physical activity. Opportunities could also be created to provide no or low-cost physical activity programs for pregnant women. This could be incorporated as a component of the Canadian Prenatal Nutrition Program. For any activities offered to pregnant women, transportation must be considered because many women live far from the Aboriginal community's town site and do not have access to vehicles.

*Community Level*

Creating a supportive physical and economic environment is essential in order to promote healthy eating and physical activity among pregnant women. This involves making healthy choices the easy choices. It was evident in this study that healthy foods were perceived as being expensive and inaccessible, and women felt that the cost and availability of healthy foods were barriers to following a healthy diet. Community initiatives could improve the accessibility and lower the cost of healthy foods through pricing strategies. For instance, the price of fruits and vegetables, which many women considered to be unaffordable, could be lowered. This may require increasing the cost of lower nutritional value foods to offset the cost to store owners. Some women identified a lack of opportunities for physical activity in the community as a barrier to being active. Community initiatives can enhance women's opportunities for physical activity. For instance, the community could prioritize the construction and maintenance of walking

paths, and address women's concern about vicious dogs present in the community. Community-based interventions to promote healthy eating and physical activity have been successfully implemented in Kahnawake as part of a diabetes prevention project (Macaulay et al., 1997).

*Policy Level*

Building healthy public policy is essential in order to make it easier for individuals to make healthy choices (Epp, 1986; World Health Organization, 1986). Policy initiatives can help create and sustain supportive economic and physical environments. The development of healthy policies has been proposed as a strategy to address the obesity epidemic (e.g., Kumanyika, 2001). The findings from the present study indicate the need for policies to ensure the provision of healthy foods in the community at a reasonable price, and to ensure opportunities are available for physical activity.

Policy initiatives are also needed to ensure adequate social assistance for women living below the low-income cut-offs so they have sufficient income to afford healthy foods and opportunities for physical activity. Social assistance allowances have been found to be insufficient to purchase healthy foods in Canada, and often funds meant for purchasing food are spent on other essential costs such as rent because of insufficient allowances for other needs (Travers, 1996).

In summary, the present research indicates the need for health promotion action at multiple ecological levels in order to prevent the complex phenomenon of excessive prenatal weight gain and its resulting health implications.

### *Recommendations for Future Research*

Further research is necessary in order to further understand and prevent excessive prenatal weight gain and to develop potential prevention strategies. The themes that emerged in this study should be further explored through additional qualitative research. Quantitative studies could establish links between the environmental influences, health behaviours, and prenatal weight gain. As well, research initiatives could develop, implement, and evaluate interventions to prevent excessive weight gain among Aboriginal women.

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## APPENDIX A

### Interview Guide

| |
|---|
| 1. *How did you feel about your body during your pregnancy?*<br>What influenced this? |
| 2. *What do you think about weight gain during pregnancy?*<br>What do you think is a healthy amount of weight to gain during pregnancy? Why? |
| 3. *Do you think you gained a healthy amount of weight during your last pregnancy?* Why/Why not? |
| 4. *Tell me what you think about physical activity during pregnancy.*<br>What were your experiences with physical activity during your pregnancy? |
| 5. *Tell me what you think about eating habits during pregnancy.*<br>What were your experiences with eating when you were pregnant? |
| 6. *Tell me about any stress that you experienced when you were pregnant, if any.*<br>What influenced your stress level? |
| 7. *Tell me about any support or help from others that you had during your pregnancy, if any.* |
| 8. *Tell me about any advice that was given to you related to weight gain during your pregnancy.*<br>Who did you get advice from about you weight gain? |
| 9. *What do you think helps women to gain healthy weight during pregnancy?* |
| 10. *What do you think makes it hard for women to gain healthy weight during pregnancy?* |

## APPENDIX B

### Background and Demographic Questions

| |
|---|
| 1. Are you single, married, or do you have a common-law partner? |
| 2. How many children live with you? |
| 3. What education level do you have?<br>Options: Below grade 10<br>Grade 10-12<br>College or university [completed or partially completed] |
| 4. Family income level as per National Council of Welfare (2002) low-income cut-offs. |
| 5. Did you go to prenatal classes during your last pregnancy? If yes: How many?[a] |
| 6. How many prenatal visits did you have with a doctor in your last pregnancy?[a]<br>When were they? Options: first trimester, second trimester, third trimester |
| 7. Did you have counselling from a dietitian or nutritionist during your pregnancy? How many times?<br>When were they? Options: first trimester, second trimester, third trimester |

[a] Self-reported data was compared to that obtained from clinic charts when it was available. Information from the clinic chart was used if a discrepancy existed.

# APPENDIX C

## Letter of Ethics Approval

Health Research Ethics Board

2J2.27 Walter Mackenzie Centre
University of Alberta, Edmonton, Alberta T6G 2R7
p.780.492.9724
p.780.492.0459
f.780.492.7303
ethics@med.ualberta.ca

*UNIVERSITY OF ALBERTA HEALTH SCIENCES FACULTIES,*
*CAPITAL HEALTH AUTHORITY, AND CARITAS HEALTH GROUP*

**HEALTH RESEARCH ETHICS APPROVAL**

| | |
|---|---|
| **Date of HREB Meeting:** | June 6, 2003 |
| **Name of Applicant:** | Dr. Kim Raine & Tara Black |
| **Organization:** | University of Alberta |
| **Department:** | Centre for Health Promotion Studies |
| **Project Title:** | **Understanding prenatal weight gain among** First Nations **women** |

The Health Research Ethics Board (HREB) has reviewed the protocol for this project and found it to be acceptable within the limitations of human experimentation. The HREB has also reviewed and approved the subject information letter and consent form.

The deliberations of the HREB included all elements described in Section 50 of the *Health Information Act*, and found the study to be in compliance with all the applicable requirements of the Act. The HREB determined that consent be obtained for the disclosure of the health information to be used in the research from the individuals who are the subjects of the information.

The approval for the study as presented is valid for one year. It may be extended following completion of the yearly report form. Any proposed changes to the study must be submitted to the Health Research Ethics Board for approval. Written notification must be sent to the HREB when the project is complete or terminated.

Glenn G. Gruenis

for Dr. Sharon Warren
Chair of the Health Research Ethics Board
(B: Health Research)

File number: B-220603

University of Alberta · Capital Health · CARITAS HEALTH GROUP

APPENDIX D

Information Letter to have Chart Reviewed and to be Contacted by the Researcher

**Title of Project:** Understanding Prenatal Weight Gain Among Aboriginal Women

**Principal Investigator:** Tara Black, R.D.N., MSc Student
Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-4039

**Co-Investigators:** Dr. Kim Raine, Director, Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-9415
Dr. Noreen Willows, Assistant Professor,
Agricultural, Food & Nutritional Science,
University of Alberta, Phone: (780) 492-3989

**Purpose:**
The reason for this study is to find out about how women's weight changes when they are pregnant. We would like to find out [name of First Nations group] women's thoughts about what helps or prevents healthy weight gain in pregnancy.

**Procedure:**
We would like to review your clinic chart and your infant's clinic chart (from your most recent birth). We would also like to be able to contact you to tell you more about the research and to invite you for an interview. Not all women who give consent will be contacted.

**Risks:**
We do not foresee any discomforts or risks for you.

**Benefits:**
This research will help prenatal staff to better understand weight change during pregnancy. Healthy weight gain in pregnancy helps to ensure the health of mothers and their unborn children. It will be useful to [name of First Nations group] women to make sure prenatal care meets their needs. It will help them to gain healthy weight when they are pregnant.

**Privacy and Confidentiality:**
All information will be held private, except when professional codes of ethics or the law requires reporting. Only the research team will have access to the data. The information obtained from your chart will be kept for at least five years after the study is done. The information will be kept in a secure area. Your name or any other identifying information will not be attached to the information obtained from your chart. Your name will also never be used in any presentations or publications of the study results. The information gathered for this study may be looked at again in the future to help us answer other study questions. If so, the ethics board will first review the study to ensure the information is used ethically.

**Freedom to Withdraw:**
You have the freedom to withdraw at any point in the study. You have the right to refuse to answer any of the questions asked. Your care at the prenatal/postnatal clinic will not be affected.

**Additional Contact:**
For more information on this study, please contact:

Tara Black, Principal Investigator
Phone: (780) 492-4039

If you have any concerns with this study, please contact:
Helen Madill, Graduate Program Coordinator
Center for Health Promotion Studies
University of Alberta
Phone: (780) 492-8661

Participant's initial: _____
Nurse's initial: _____

APPENDIX E

Consent Form for Chart Reviews and to be Contacted by the Researcher

| **Part 1: Researcher Information** | | |
|---|---|---|
| Principal Investigator: Tara Black, R.D.N, MSc Student<br>Affiliation: University of Alberta, Centre for Health Promotion Studies<br>Contact Number: (780) 492-4039 | | |
| Co-Investigators/Supervisors:<br>Dr. Kim Raine<br>Affiliation: Director, Centre for Health Promotion Studies<br>Contact Number: (780) 492-9415<br><br>Dr. Noreen Willows<br>Affiliation: Assistant Professor, Department of Agricultural, Food and Nutritional Science.<br>Contact Number: (780) 492-3989 | | |
| **Part 2: Consent of Subject** | | |
| | **Yes** | **No** |
| Do you understand that you have been asked to be in a research study? | | |
| Have you read and received a copy of the attached information sheet? | | |
| Do you understand the benefits and risks involved in taking part in this research study? | | |
| Have you had an opportunity to ask questions and discuss the study? | | |
| Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your care. | | |
| Has the issue of confidentiality been explained to you? Do you understand who will have access to your records/information? | | |
| **Part 3: Signatures** | | |
| This study was explained to me by:<br>_____<br><br>Date:<br>_____ | | |
| *I agree to have my chart reviewed and my infant's chart reviewed (most recent birth).*<br><br>Signature of Research Participant:<br>_____<br><br>Printed Name:<br>_____ | | |

Witness (if available):

_____

Printed Name:

_____

*I believe that the person signing this form understands what is involved in the study and voluntarily agrees to take part.*

Nurse:_____

_____

Printed Name:

_____

*I agree to be contacted by the researcher.*

Signature of Research Participant:

_____

Printed Name:

_____

Witness (if available):

_____

Printed Name:

_____

*I believe that the person signing this form understands what is involved in the study and voluntarily agrees to take part.*

Nurse:_____

_____

Printed Name:

_____

APPENDIX F

Information Letter for Consent to be Interviewed

**Title of Project:** Understanding Prenatal Weight Gain Among Aboriginal Women

**Principal Investigator:** Tara Black, R.D.N., MSc Student
Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-4039

**Co-Investigators:** Dr. Kim Raine, Director, Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-9415
Dr. Noreen Willows, Assistant Professor,
Agricultural, Food & Nutritional Science,
University of Alberta, Phone: (780) 492-3989

**Purpose:**
The reason for this research is to find out about how women's weight changes when they are pregnant. We would like to find out [name of First Nations group] women's thoughts about what helps or prevents healthy weight gain in pregnancy.

**Procedure:**
You will be interviewed two times. Each interview will last up to one hour. The interviews will take place at a time that works for you. They will be held in your home and will involve only you and the researcher. They will be tape recorded and later typed into a computer.

**Discomforts or Risks:**
You may be inconvenienced by the time that is needed for the interviews. Although unlikely, it is possible that you may be uncomfortable with talking about weight. If you feel you need support, you can call the Samaritan Crisis Line. The toll-free number is 1-800-667-8089. This service will give you support over the phone. It can also tell you about other services that might be able to help you.

**Benefits:**
This research will help prenatal staff to better understand weight change during pregnancy. Healthy weight gain in pregnancy helps to ensure the health of mothers and their unborn children. It will be useful to [name of First Nations group] women to make sure prenatal care meets their needs. It will help them to gain healthy weight when they are pregnant. For each interview, you will receive a $20 gift certificate for the Standoff grocery store.

**Privacy and Confidentiality:**
All data will be held private, except when professional codes of ethics or the law requires reporting. Only the research team will have access to the data. The information you provide will be kept for at least five years after the study is done. The information will be kept in a secure area. Your name or any other identifying information will not be attached to the information you gave. Your name will also never be used in any presentations or publications of the study results. The information gathered for this study may be looked at again in the future to help us answer other study questions. If so, the ethics board will first review the study to ensure the information is used ethically.

**Freedom to Withdraw:**
You have the freedom to withdraw at any point in the study. You have the right to refuse to answer any of the questions asked. Your care at the prenatal/postnatal clinic will not be affected.

**Contact:**
For more information on this study, please contact:
Tara Black, Principal Investigator
Phone: (780) 492-4039

If you have any concerns with this study, please contact:
Helen Madill, Graduate Program Coordinator
Center for Health Promotion Studies
University of Alberta
Phone: (780) 492-8661

Participant's initial: _____
Researcher's initial: _____

APPENDIX G

Consent Form for Interviews with Women and for Informal Interviews with Staff

| **Part 1: Researcher Information** | | |
|---|---|---|
| Name of Principal Investigator: Tara Black, R.D.N, MSc Student<br>Affiliation: University of Alberta, Centre for Health Promotion Studies<br>Contact: (780) 492-4039 | | |
| Name of Co-Investigator/Supervisor: Dr. Kim Raine<br>Affiliation: Director, Centre for Health Promotion Studies<br>Contact: (780) 492-9415 | | |
| Name of Co-Investigator/Supervisor: Dr. Noreen Willows<br>Affiliation: Assistant Professor, Department of Agricultural, Food and Nutritional Science.<br>Contact: (780) 492-3989 | | |
| **Part 2: Consent of Subject** | | |
| | **Yes** | **No** |
| Do you understand that you have been asked to be in a research study? | | |
| Have you read and received a copy of the attached information sheet? | | |
| Do you understand the benefits and risks involved in taking part in this research study? | | |
| Have you had an opportunity to ask questions and discuss the study? | | |
| Do you understand that you are free to refuse to participate or withdraw from the study at any time? You do not have to give a reason and it will not affect your care. | | |
| Has the issue of confidentiality been explained to you? Do you understand who will have access to your records/information? | | |
| **Part 3: Signatures** | | |
| This study was explained to me by: _____<br>Date: _____ | | |
| *I agree to take part in this study.*<br>Signature of Research Participant: _____<br>Printed Name: _____ | | |
| Witness (if available): _____<br>Printed Name: _____ | | |

*I believe that the person signing this form understands what is involved in the study and voluntarily agrees to participate.*

**Researcher or Nurse:**

_____

**Printed Name:**

APPENDIX H

Information Letter for Consent from Staff to be Informally Interviewed

**Title of Project:** Understanding Prenatal Weight Gain Among Aboriginal Women

**Principal Investigator:** Tara Black, R.D.N., MSc Student
Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-4039

**Co-Investigators:** Dr. Kim Raine, Director, Centre for Health Promotion Studies
University of Alberta, Phone: (780) 492-9415
Dr. Noreen Willows, Assistant Professor,
Agricultural, Food & Nutritional Science,
University of Alberta, Phone: (780) 492-3989

**Purpose:**
The reason for this research is to find out about how women's weight changes when they are pregnant. We would like to find out [name of First Nations group] women's thoughts about what helps or prevents healthy weight gain in pregnancy.

**Procedure:**
You may be informally asked questions about prenatal care. This may last up to 30-45 minutes. The interviews will take place at a time that works for you.

**Discomforts or Risks:**
You may be inconvenienced by the time that is needed to answer the questions.

**Benefits:**
This research will help prenatal staff to better understand weight change during pregnancy. Healthy weight gain in pregnancy helps to ensure the health of mothers and their unborn children. It will be useful to [name of First Nations group] women to make sure prenatal care meets their needs. It will help them to gain healthy weight when they are pregnant.

**Privacy and Confidentiality:**
All information will be held private, except when professional codes of ethics or the law requires reporting. Only the research team will have access to the data. The information you provide will be kept for at least five years after the study is done. The information will be kept in a secure area. Your name or any other identifying information will not be attached to the information you gave. Your name will also never be used in any presentations or publications of the study results. The information gathered for this study may be looked at again in the future. This will help us answer other study questions. If so, the ethics board will first review the study to ensure the information is used ethically.

**Freedom to Withdraw:**
You have the freedom to withdraw at any point in the study. You have the right to refuse to answer any of the questions asked.

**Additional Contact:**

For more information on this study, please contact:
Tara Black, Principal Investigator
Phone: (780) 492-4039

If you have any concerns with this study, please contact:
Helen Madill, Graduate Program Coordinator
Center for Health Promotion Studies
University of Alberta
Phone: (780) 492-8661

Participant's initial: _____
Nurse's initial: _____